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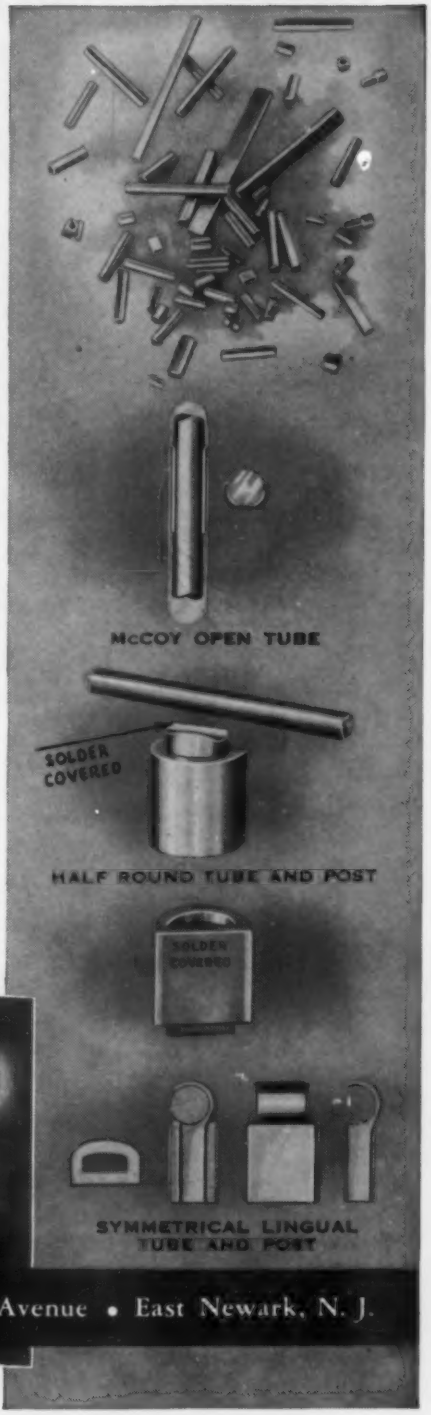

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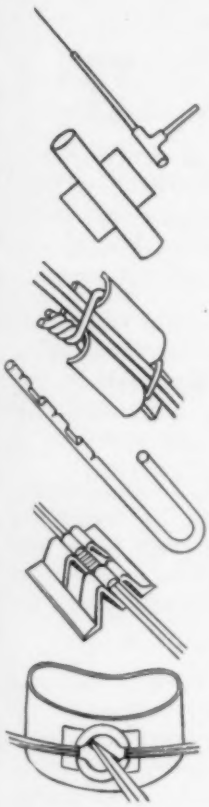

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UNICEF is also providing certain supplies and equipment for other large-scale medical programs given for (1) the control of tuberculosis in children already affected; (2) the control of malaria and other insect-borne diseases; (3) the cure of syphilis in pregnant women, as a means of protectng their infants; (4) yaws-control, yaws being a disabling and disfiguring disease that affects millions of children in certain countries of Asia and Central America and (5) general maternal and child-health programs.

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U. N. Children's Fund Committee, New York 16, New York

American Journal
of
ORTHODONTICS

VOL. 36 MAY, 1950 NO. 5

Original Articles

PRESIDENT'S ADDRESS

NORTHEASTERN SOCIETY OF ORTHODONTISTS

ROBERT H. W. STRANG, M.D., D.D.S., BRIDGEPORT, CONN.

UNDER the dictates of our constitution and bylaws your presiding officer must give an account of his administration during the past year. It is also his privilege to suggest constructive ideas which, in his opinion, may be for the betterment of the Society.

Unfortunately, you have had for your president this past year one whose association with the working units of the organization, in past years, has been extremely limited. Consequently, in preparing this address, I have been obliged to appeal for help and guidance to various members whose knowledge of these important details has been of an intimate nature. To these individuals I express my thanks for their cooperation.

It was my pleasant duty to carry out the constructive suggestions made by my predecessor, Dr. Hillyer, in the reappointment of the same committees on education and on laws of specialization as were in service during his tenure of office.

Our presence in Boston for this session also is tangible evidence that his suggestion of holding one of our semiannual meetings in another city, other than New York, has been adopted. It is my hope that this plan will continue in action.

Unquestionably the most critical problem confronting the dental profession today, and coincidentally our own specialty, is that of Federal Government control over the practice of dentistry. In spite of the evidence of the impracticability of administering a plan such as the "compulsory health insurance" scheme, as illustrated by the chaotic conditions in England, our President is

Presented at the meeting of the Northeastern Society of Orthodontists, Boston, Mass., March 7, 1950.

still insistent that such a law shall be enacted in this country. Dr. Hillyer suggested that a committee be appointed to confer with the officers of the American Association of Orthodontists, with the object of evoking concerted action against such legislation. Your president has been remiss in not appointing such a committee and apologies are due. Fortunately, it is not too late for such a committee to be appointed to take this matter up at the next meeting of the parent body and he now urges that Dr. Hillyer's suggestion be heeded and such a committee be appointed at this session, if the members are in accord with the idea. Certainly the situation is acute and such an action is warranted.

Political influence is quite rampant in its efforts to reduce the high standards of the practice of dentistry in our land. Playing Santa Claus to the hoi polloi, namely, the masses, as a vote-getting inducement, has proved very effective. The Massachusetts law, legalizing the training of dental hygienists to perform dental operations on children, and the vetoing by the Governor of the proposed law in Connecticut which would prohibit dental laboratories from doing prosthetic work for individuals, in other words from practicing dentistry without a license, are tragic examples of the invasion of governmental bodies upon the welfare of our profession. Organized dentistry cannot afford to let such activities pass unchallenged. We, in turn, as oral specialists, should give our support to our colleagues in all programs planned to counteract such political debaucheries. Complacency spells disaster. The entrance of destructive wedges of this kind are certain to be followed by more drastic invasions which will eventually terminate in complete Federal control of our profession.

Already bills have passed in the Senate authorizing financial aid to medical and dental colleges. Financial backing of this kind will certainly be accompanied by power to dictate educational policies. This is an attack on the very heart of professional standards for it is tempting bait amounting to hundreds of thousands of dollars and shortsighted educators are bound to fall for such an alluring temptation. Your president urges that this Society go on record as opposed to having any of our dental schools accept financial aid from the Federal Government and that record of this action be forwarded to the deans of all dental educational institutions.

There is no question but that the members of the American Association of Orthodontists are not sufficiently concerned with the problem of orthodontic services for children whose parents are definitely located in the low-income bracket. It would be a very wise and foresighted procedure if the members of our Society sanctioned the appointment of a committee to confer with the governing body of the American Association with the object of arousing interest in this public health service. The program of the New York State Department of Health, providing orthodontic care for children of parents who cannot afford private service, could be presented to our parent body for analysis. Unquestionably this is a very vital problem to consider at the present time. The paper entitled "Suggested Principles for Public Orthodontic Programs for Children," by Dr. John T. Fulton, and published in the September, 1948, issue of the JOURNAL also furnishes basic suggestions for consideration. It is certain that

if we do not heed the writing on the wall, we will have some Federal laws enacted that will not make pleasant reading.

So much then for our relationship and responsibility to national policies and crises. Let me now turn your attention to a few items that are more intimately related to our orthodontic family circle. Since its inauguration, the *Orthodontic Directory of the World* has been compiled and published as a private enterprise. Too much praise and gratitude cannot be extended to those individuals who, past and present, have given freely of their time and energy, to furnish to our specialty this important and valuable volume. However, it would seem that the time has now come when this publication should be sponsored by the American Association of Orthodontists and edited by and published by a committee appointed by that body. Excellent as this publication is at the present time, it necessarily reflects the policies and ideas of the limited group of individuals who now control its publication. If it were placed under the control of the American Association of Orthodontists, the constructive criticism of individual members of that Society would be a valuable asset and result in incorporating additional information that would be exceedingly helpful to the profession. To that end I recommend that our delegates to the American Association of Orthodontists be instructed to bring this suggestion before the next meeting of the parent body.

At the last meeting of our Society, the President was authorized to appoint two ex officio members to the Executive Committee who would act as the local personnel of arrangements for this Boston meeting. Drs. Beebe and Tisdale were subsequently appointed and their cooperative and effective service is worthy of the highest commendation. The duties of the Executive Committee have always been exceedingly burdensome as it falls to their lot not only to provide the essayists and clinicians for the program but also to take care of all the details connected with hotel arrangements for the meeting. This latter problem was arduous enough when all the sessions were held in New York. Now that one of the meetings will be held in another city, it is most essential that as much of this burden as possible be lifted from their shoulders. To that end I suggest that Article VIII, Section 1, of the constitution be amended to permit enlarging the Executive Committee to five members instead of three. This will allow the president to appoint at least two members to this committee who are residents of the city in which the alternate meeting will be held.

Another handicap under which the Executive Committee is working is the lack of a budget to care for the honoraria and expenses of visiting essayists and clinicians. I suggest that a definite sum be allocated each year as a budget for this specific purpose.

I would be most remiss and exceedingly ungrateful if I did not take this opportunity to thank all of the members of the various committees who have worked throughout my administration, for their wholehearted cooperation and efficient service. I wish especially to emphasize my admiration for, and gratitude to, the marvelous devotion to duty exhibited by the Executive Committee, composed of Dr. Prezzano, Chairman, and Drs. Joule and Bedell. Never,

in all my long career in orthodontic societies, have I found such efficient service and cooperation as these men have given to me and to the Society. I thank them from the very depth of my heart. I am sure that this expression of gratitude is endorsed by all our members for I know all have profited greatly by the excellent programs that this Executive Committee has provided.

It has been a great honor to serve as president of this large society of orthodontists, and I thank you one and all for the confidence expressed in permitting me to act in this capacity. To my successor, Dr. Lowy, I extend congratulations and a sincere wish that his year of service may be as pleasant and stimulating as mine has been.

MESSAGE FROM THE PRESIDENT OF THE AMERICAN DENTAL ASSOCIATION

PHILIP E. ADAMS, D.M.D., BOSTON, MASS.

INASMUCH as the actions of the House of Delegates and Board of Trustees are reported in *The Journal of the American Dental Association* rather completely, it would seem to me that a discussion of American Dental Association affairs should not concern itself with the minutiae of individual actions but rather with the broad principles which underlie the whole philosophy of the Association.

In order to understand the philosophy of the American Dental Association it is necessary to know the object of the Association and the methods for implementing this objective. As stated in the revised bylaws, "The object of this Association shall be to encourage the improvement of the health of the public and to promote the art and science of dentistry."

The first duty then of the Association as a professional organization is to encourage the improvement of the health of the public. In total this discharges the obligation of the Association and justifies its existence as an essential health agency. This duty of encouraging the improvement of the health of the public is not, however, as simple as might appear at the first glance. Among other things it involves the development of equitable dental practice acts, the fostering of strong state and community dental organizations so that the profession can be well represented in those areas, the exposure of quacks and charlatans who prey on the public with useless or dangerous remedies, the publication of scientific literature so that the profession may use the advances of science to serve the public better, the aid of dental research to find better methods for preventing and controlling dental disease, the establishment of standards in dental education to protect the quality of practitioner who serves the public, the duty of interesting young persons in the study of dentistry so that the supply may become more adequate to meet the need of the public, participation in public health programs so that the public is not deprived of an essential health service, the fostering of dental health education programs so that more persons become aware of the usefulness of dentistry as a health service, and the development of sound programs for community, state, and national dental health so that all of the enterprises of the profession will continually raise the standard of dental health in the nation.

This list might be endless because, by extension, everything that happens in dentistry must have some effect on the welfare of the public and on the attainment of the objectives of this Association. The tasks involved here, however, are so many and so large that the Association must necessarily establish certain priorities in activity so that available funds and resources will be productive of the most good for the public. It is this problem of establishing priorities, of cutting the garment to fit the cloth, that is critical in the American Dental Association at the present time.

Read before the Northeastern Society of Orthodontists, New York, N. Y., Nov. 29, 1949.

The American Dental Association is now completing a period of growth which has no parallel in American professional organizations. In 1922, the membership of the Association was 27,000 and today it is nearly three times that figure. This growth has come about not only because the Association made itself more valuable to members but also because the society at large has come to recognize that dentistry is an essential health service. This recognition of the dental profession is something for which dentists have striven for many generations and now that it has come in increasing measure, the profession and the Association must recognize that more demands will be made upon them by society. These demands are directly related to the problems of the Association, to the cost of activities, and to the dilemma of expanding or contracting activities.

It is not enough to make the easy complaint that the Association has expanded very rapidly in the past decade. This expansion was exactly what generations of dentists the country over were seeking through their state and local society membership committees. Now that it is here, dentistry must decide if it is going to meet the obligations that come with social maturity or if it is going to stand still and return to a place in the social order where less demands are made of it and where the public comes again to regard dentists as mechanics who make little contribution to public health.

The American Dental Association's second duty, of course, is to its members. It goes without saying that whatever is done in the public interest is also in the interest of the members who dedicate their lives to the service of the public. The list of activities through which the Association serves its members is almost a duplicate, therefore, of the list of activities through which the Association serves the public.

In addition to the activities concerned with the improvement of the health of the public, previously mentioned, the American Dental Association through its officers, councils, committees, and staff does the following things:

1. Provides a framework of organization and policy for the constituent and component societies.

2. Sponsors an annual state officers' management conference and an annual state officers' conference in order to aid constituent societies in solving their problems.

3. Establishes a code of ethics for the dental profession in order to have a public statement of the dentist's responsibility to society, to his profession, and to his colleagues.

4. Stages an annual scientific session for the exchange of scientific thought and ideas.

5. Provides the mechanism through which the dental profession in the United States can be represented to society as an essential, unified agency of health.

6. Approves internships, residencies, and specialty boards.

7. Conducts an experimental program in aptitude testing in order to provide dentistry with a better means of selecting qualified students for the limited number of places available in dental schools.

8. Maintains a register of oral and pathologic specimen case histories.

9. Supports research in the field of dental materials and in the causes of disease and abnormalities of the oral cavity.

10. Evaluates and disseminates information in regard to dental therapeutic and cosmetic agents.

11. Maintains a continuing study of relations between the profession and the dental laboratory and dental laboratory technician group.

12. Promotes an accreditation program for the regulation of the laboratory craft.

13. Maintains a continuing study of problems in the federal government dental corps with a view to improving the quality of service rendered by these agencies.

14. Collects material of historical interest to the dental profession.

15. Examines hospital dental departments and issues certificates of approval on compliance with certain standards.

16. Provides a program of group life insurance.

17. Fosters relations with international dental groups in the advancement of the objectives of the dental profession.

18. Protects and furthers the interests of the public and of the profession in matters of state and federal legislation.

19. Provides assistance to constituent and component societies in the matter of state legislative problems.

20. Maintains a complete file of all dentists in the United States for purposes of record and information.

21. Publishes a directory of all dentists in the United States.

22. Supports an agency for the relief of needy dentists.

23. Supports a bureau which conducts statistical study and research in order to provide the profession with information needed to develop its various programs.

24. Supports an agency for providing the public and the profession with information regarding the Association and the profession.

25. Maintains a library and a library-package service for the use of members and other interested individuals.

26. Maintains a chemical laboratory for various studies and researches of dental interest.

27. Publishes an official journal which is the acknowledged leader in national and international dentistry.

28. Publishes a specialty journal in oral surgery.

29. Publishes annually a handbook of dental therapeutic agents which is the accepted text in its field.

30. Publishes an index of the dental periodical literature which is the only recognized index in the entire profession.

31. Provides speakers on a variety of topics of dental interest.

This list could be continued almost indefinitely because all of the Association's activities, no matter how remote they may seem to the average dentist at first glance, have some relation to every dentist and to his profession.

Historically for many years the Association was expanding its membership but did not expand its activities in the same ratio. The result was that the earnings in a fairly sizable surplus enabled members to get many benefits without paying for them. This is no longer the case. The very large membership, the many demands it makes and should have, the lowered rates of interest which prevent the earnings of previous years, and the reduced purchasing power of the dollar, plus the reduction of surplus funds which previously provided extra money, all combine to make current income barely adequate for current activities.

This matter has been of concern to the Board of Trustees of the American Dental Association and at the recent San Francisco meeting the Board presented to the House of Delegates several plans to bolster the financial status of the Association immediately. The House of Delegates was apparently reticent to give unanimous consent for adoption of any of these plans at that time, preferring to consider the matter of a raise in dues at the next annual session. We should be proud of the vision of our House of Delegates who, going beyond the conservative suggestions of the Board of Trustees, have by a large majority indicated their desire to make adequate financial support available by suggesting an increase in the dues of the Association of eight dollars. This means that each member will be asked to contribute one dollar and sixty-six and two-thirds cents a month instead of the one dollar he now pays to support the American Dental Association.

We have made some mention of the objectives and duties of the Association. Among others, one of the prime duties of the Association to its members is to see that they are permitted that form of practice under which they can best serve the public and earn a livelihood consistent with their training and the service that they render.

This cannot be done under certain forms of practice as has been richly demonstrated in other countries of the world. It is the Association's heavy responsibility to use every resource at its command to prevent forms of practice that cannot serve the dental health of the people. If the profession is not prepared to make real sacrifices in this area, it must risk the disintegration of the profession which inevitably accompanies the yielding to governmental control through a system of compulsory health insurance or otherwise.

What is being done and what should be done to counteract the efforts of those who would saddle us with a method of health care which is economically, professionally, and statistically impractical?

Two methods are now in operation: legislative activity; lay and professional education regarding health insurance, so-called.

We have been ably represented in our legislative activities; our legislative efforts have resulted in a high measure of success. No greater testimonial could be given to the late Carl Flagstad than the record of legislative success during his chairmanship. The Legislative Committee has developed plans for an improved set-up both as to coverage and methods of getting pertinent information to our contact men. This plan has been presented to the Board of Trustees at their recent meeting.

Imitation is the sincerest form of flattery, and I am given to understand that the medical profession in certain western states has petitioned the American Medical Association to develop a legislative set-up similar to that of the American Dental Association.

We have distributed in the past few months thousands upon thousands of pieces of literature designed to acquaint the laity and the profession with the issues of compulsory health insurance.

These legislative and educational efforts are necessarily only delaying actions. As stated in the American Medical Association National Campaign Reporter: "The immediate objective is the defeat of the Compulsory Health Insurance program in the Congress—and there is great urgency in that phase of the problem. The long term objective is to put a permanent stop to the agitation for Compulsory Health Insurance.—This is an affirmative campaign, not just a negative campaign."

The positive side of our campaign is in the proposals of the American Dental Association which are basic to the development of a sound national dental health program. We are in a fortunate position in having adopted these proposals a decade ago rather than under the stress of pending legislation.

The first principle is that of adequate research. The American Dental Association has spent thosuands of its own funds in the establishment and maintenance of research projects in the field of dental materials and biologic research through the maintenance of research fellowships at the National Institutes of Health and the Bureau of Standards. The Association has long recognized that research activities from all sources are totally inadequate to solve the many problems. However, we have been greatly encouraged by the passage of the Dental Research Act and the appropriation of initial funds to implement it.

The second principle, education of the public to motivate it to seek dental care, has gained momentum through dental health education in schools, American Dental Association material, publicity relative to recent developments in caries prevention, and numerous other sources. This is indicated by the increased expenditure of the public for dental care.

The third principle, development of service programs particularly directed toward the care of children, needs much thought. While much has been done in certain communities to develop comprehensive methods of dental care for children, there seems a large area of knowledge to be supplied as to the best methods.

It is my hope that the Council on Dental Health will inaugurate pilot studies at varying community levels designed to ascertain the best methods of dental care for children at that particular level. If funds are not available from the Association, the Council should be empowered to seek such funds from outside sources.

The fourth principle, as revised and adopted at Chicago in 1944, states that in all conferences that may lead to the formation of a plan for dental research, dental health education, and dental care, there should be participation by authorized representatives of the American Dental Association.

At the recent San Francisco meeting the Council on Dental Health submitted by resolution an elaboration of these four basic principles which sets

out in some detail how the dental health program can be implemented on local, state, and national levels. In introducing the resolution the Council on Dental Health stated, "The dental profession in this country long has urged a constructive approach to the national dental health problem . . . . the profession's proposals represent a scientific, feasible, economical, and rational approach to the problems of dental diseases in direct contrast with the costly and unrealistic proposals bound up with a system of federal compulsory health insurance."

Dentistry has matured to the point where we are accepted in the health planning of the future. This is evidenced by the fact that dental care is included in all health proposals at the community, state, and federal level. This creates a responsibility on the part of the dental profession which we must be prepared to assume.

We must make provision in our allocation of funds to assure dentistry's taking its proper place among the great health professions in all conferences concerned with the health of the people.

Many of you undoubtedly saw the recent announcement of the formation of an Inter-Association Committee on Health, composed of representatives of the American Dental Association, the American Hospital Association, the American Medical Association, the American Nursing Association, the American Public Health Association, and the American Public Welfare Association. This committee, representing as it does thousands and thousands of workers in the health field, will be a potent influence in those areas of common agreement on health matters. We should all be proud that dentistry is included in this group.

One cannot consider this important issue with which we are confronted without coming to the realization that we are living in an age of changing social concepts. We should avail ourselves of every opportunity to influence these changes along paths that will best benefit the public and the profession.

Roscoe Pound, LL.D., University Professor Emeritus, Harvard University, formerly Dean, Harvard Law School, in a recent paper[1] closed the paper by stating:

"After all the individual man is the moral, social and legal unit. Certain of his activities may be organized in groups and associations and political societies. But his personality is not merged in any of them. Recognition of the moral worth of the individual human being is the great achievement of the political and juristic philosophy of the eighteenth and nineteenth centuries. Appreciation of the social interest in the individual life is the significant achievement of the social philosophy of the present generation. It is not likely that any political or economic order that may supervene in such time as we can foresee will succeed in putting down the individual self-assertion that has been a motive force of progress. But the attempt to put it down with a sole eye to regimented co-operation may do a great deal of harm.

"There has always been a human tendency to worship rulers. Today, majority dictation is often reverenced as the monarch's arbitrary dictation was in the seventeenth century. Lord Acton tells us that all power corrupts; absolute power corrupts absolutely. Majority-dictated science, majority-dictated philosophy and majority-dictated teaching take us back to the absolute rulers

whom we set up majority rule to overthrow. The service state is a political step forward. But we must not let it turn back upon itself and lead us to absolutism. There is no surer route to absolutism than an unchecked omnicompetent bureaucracy."

It is self-evident that one of the most important aspects of our planning must be a knowledge of social philosophy. We have in our employ one of the best-informed men in this field. I am referring to our general secretary, Dr. Harold Hillenbrand. During the three years of his employment as general secretary, he has been largely concerned with the development of a workable administrative pattern for the Association. With the adoption of our new bylaws and the establishment of definite lines of authority, it would seem that he could be relieved of many of the administrative details which have occupied his time heretofore. I sincerely hope that provision can be made for the better utilization of the broad background in social philosophy he possesses.

I have attempted to indicate the objectives, activities, and obligations of the American Dental Association and to emphasize the most important issue before us.

Every member in contemplating these matters naturally wonders what he as an individual member can do to assist. The most significant contribution the individual member can make is to be fully informed of the implications inherent in the whole security program now before Congress. He should understand the effect of these proposals not only upon his profession but also upon the economy of the country as a whole. He should discuss these proposals with his friends and patients. A field of discussion which everyone understands and in which the professional man is perfectly safe because he can discuss it as a citizen is that of cost. It is estimated that the cost of the whole security program could rise to forty billion dollars a year. This is not the estimate of some person who is opposed to this security program but the estimate of the government itself.

I think we all could subscribe to the statement made by one of our early statesmen, Thomas Jefferson:

"I place economy among the first and most important virtues, and public debt as the greatest of dangers to be feared. . . . To preserve our independence, we must not let our rulers load us with perpetual debt. . . . We must make our choice between economy and liberty or profusion and servitude. . . .

"If we run into such debts, we must be taxed in our meat and drink, in our necessities and our comforts, in our labors and in our amusements. . . . If we can prevent the Government from wasting the labors of the people, under the pretense of caring for them, they will be happy."

I have quoted freely and without specific reference from the Report of the Special Survey Committee of the House of Delegates which appears in the Report of Officers and Councils of the American Dental Association, pages 108 to 152. Due acknowledgement is hereby given.

REFERENCE

1. Pound, Roscoe: The Professions in the Society of Today, New England J. Med., Sept. 8, 1949.

ORTHODONTICS AS A HEALTH SERVICE

JOHN T. FULTON, D.D.S.,* WASHINGTON, D. C.

THE World Health Organization has defined health as "a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity."[1] Dr. Brock Chisholm,[2] Director-General of World Health, pointed out that this definition recognizes that ". . . a necessary part of the equipment of every human being is social health, the ability to live in harmony with other people of other kinds, with other traditions, with other religions, and with other social systems, throughout the world." It is in this context that I wish to discuss the role of orthodontics as a health service.

As a starting point it seems productive to take a look at our present social environment. David Lilienthal,[3] in reviewing how men and science have organized TVA resources for the benefit of the people, said: ". . . it is just such fruits of technology and resources that people all over the world will, more and more, demand for themselves. That people believe these things can be theirs—this is the real revolution of our time, the dominant political fact of the generation that lies ahead. No longer do men look upon poverty as inevitable, nor think that drudgery, filth, famine, floods, and physical exhaustion are visitations of the devil or punishment by a deity . . . ." Secretary of State Acheson,[4] in reporting to Congress on the Marshall Plan, put it this way: "Our moving purpose is not material: it is to make it possible for people who want to live a decent, orderly and just and free life to do so again." Walter Lippmann[5] neatly summarized this position by saying: "The theory of our economic aid to Europe, then, is that it is not possible for nations to enjoy political and moral freedom if they do not have a decent standard of life."

When we consider the great drives today for broadening and strengthening our social security program, when we observe the insistence of labor organizations in the establishment of welfare and pension funds, when we note the rising tide of interest in aid to education and health insurance, when we see the firm renewal of support for agriculture or the position taken on housing, then we cannot doubt Mr. Lilienthal's "dominant political fact" that people everywhere are determined to improve their standard of life.

However, our social environment has become complicated, dangerously so, because we have entered the atomic age. Stuart Chase[6] stated our dilemma thusly: "People have begun to ask whether the human sciences can catch up with the atomic bomb. Now that man has found the secret of the ultimate energy in nature has he the knowledge, or can he find the knowledge, to control it?" No wonder Dr. Chisholm insisted that the ability to live in harmony with people of all kinds must be a necessary part of every human being's equipment.

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We have a long way to go in this respect. The last thirty-five years have produced two deadly wars. And sabres are still rattling. In fact a "cold war" has continued since the shooting stopped in 1945. It rages about us now. To survive, we must find a much better way of settling our differences. We must learn to get along with all peoples. We must learn how to live as world citizens. In other words, we must be a mature people, mentally and socially, as well as physically. A world citizen cannot afford prejudice, isolationism, unreasonable emotions, excessive desire for power, excessive fears, vengeance, and refusal to face unpleasant facts.

Yet, these human failings are common, all too common. So any health service, to be meaningful today, must strive to eliminate these shortcomings. In other words, it must contribute to the emotional maturity of people.

Does dentistry have a vital part to play in this kind of health service? I am sure that it does. The reasons for this conclusion were given elsewhere.[7] I will not enlarge upon them except to point out that orthodontics, in particular, has a great contribution to make, since it is almost wholly concerned with children, and since social scientists[8] recently said: "The single most important thing in human cultural behavior is literally and specifically the way we bring up our children. And the single most important thing ultimately in the politics of the world is the kind of human being, temperamentally, that we manufacture."

Conceding, then, that dentistry is a necessary part of health service, I wish to review, briefly, what we know of the extent and spread of present dental services.

In this connection, I refer to the charts from the Study of Child Health Services, recently published by the American Academy of Pediatrics.[9] This study covers the entire country, state by state and county by county. Its dental findings document the results obtained in scattered, smaller studies.

One of the charts shows the maldistribution of dentists in our country according to population. One state has eight times as many dentists as another in relation to children, and four times as many in relation to total population. Wide differences also exist in the various regions, as well as different counties in the same state. As might be expected, the rate at which children visit the dentist follows the same general pattern: wide variations between regions, the states within the regions, and the counties within the states. Community dental clinic services also follow this pattern. Probably the most striking and consistent pattern of the Academy study comes from relating health services to the per capita income. That health services for children are directly related to the economic level of the state appeared in every phase of the study. In fact, the study report stated, "If there is any one element which seems most consistently to lie behind these differences, it is the economic one." Distribution of dentists and child visits to the dentist and to dental clinics are remarkably consistent with this economic pattern.

The place of orthodontics in this picture is not clearly defined. The study showed that orthodontics comprised only 0.8 per cent of the total number of

dental services provided in children's dental clinics. Furthermore, 88.0 per cent of these orthodontic services were given in greater metropolitan counties and 87.5 per cent were provided in the northeastern and central group of states.

As far as private practice is concerned, the study showed that, for a group of 18 states which reported on type of practice, 95.8 per cent of the dentists are in general practice, with but 1.6 per cent of the men specializing in orthodontics. Since this figure is very close to the figure in Klein's[10] survey, it can be considered accurate. Obviously, unless many general practitioners are including orthodontics in their daily work, very few children in the United States are receiving this type of dental service.

In the light of all this, where does orthodontics stand as a health service? Salzmann[11] stated recently: "The question of orthodontics is no longer something that concerns those who have a lot of money. Orthodontics is too important in the life and welfare of children for such a limited view to prevail. The benefits of orthodontics are now appreciated by families of children of every economic level." If this is true, it is difficult to see how dental health of high quality can be assured to the nation's children if orthodontic problems continue to be ignored.

One thing seems clear. However the problem is approached or what plans and programs are designed, orthodontists themselves should be in the forefront. They are the people best qualified to give advice and direct action.

An impressive stride in this direction was taken by the American Association of Orthodontists last year. This organization established a public health committee designed to keep abreast of the growing interest in the provision of orthodontic care. Near the end of the year, this committee met in a two-day session with the Children's Bureau. Paramount in the discussion at these sessions were those areas of child health service in which orthodontic participation is badly needed. I would like to give you a brief summary of their thinking in 3 of these areas: standards, service programs, and training.

STANDARDS

Standards must be based on a scientific definition of the actual orthodontic operations necessary to maintain optimal health at the different age levels: the antenatal period and during the primary, mixed, and permanent dentitions. Such a definition is difficult because it cannot aim at absolute perfection. The objective should concern that which is physiological rather than ideal; functional and stable rather than perfect. Orthodontic treatment should not fall short of anything which might be a risk to health, but it is hard to justify at the point where it becomes a subjective art. As so often is the case, the dividing line is not sharp and clear. The definition is hard to phrase. But a start has been made in this direction, recently, with the publication of suggested "Minimum Health Standards of Orthodontic Services for Children."[12] However, only 6 orthodontists worked on this document. So it could hardly be considered the final opinion of the orthodontic profession. It does, though, represent mature and thoughtful deliberation, and it is available. I should think that it might be the point of departure for study, comments, suggestions, or revisions by

many other orthodontists. The result would be a strong, widely accepted definition. Once a good definition is established, it should be applied to defining the scope of the problem of dentofacial deformities. Little is known about the spread of these conditions through the population. Published figures are meager at best and suffer from the lack of a standard basis of classification. There is at least one classification available that has been tested for validity.[13] If it were used by orthodontists to detect impending conditions of malocclusion, it would add considerably to our knowledge of the problem. The literature is particularly barren of reports of longitudinal or seriatim data. It may well be that much material of this sort is stuffed away in desks and filing cabinets around the country. If such data were exhumed, collected, and classified, they would add immeasurably to our knowledge of the problem of malocclusion.

PUBLIC HEALTH SERVICE PROGRAMS

As pointed out, orthodontics is practically nonexistent in public health dental programs. Less than 1 per cent of the total visits per year to children's dental clinics was given over to orthodontic problems.

Every state in the Union now has an official agency conducting programs for crippled children. While the definition of handicapping conditions varies in these jurisdictions, cleft palate is included by all. Twenty-eight of these official state agencies are using the services of orthodontists in the rehabilitation of cleft palate patients. Judging by the fees reported, a great variation exists in these 28 states in the type and scope of services rendered. As far as I am aware, only 1 state in the entire country has broadened its definition of crippling conditions to include other dentofacial deformities. That is the state of New York. New York's present definition also embraces: (1) the ankylosis of the temporomandibular articulation; (2) extreme structural deformities involving growth and development of the jaws; (3) severe cases of malocclusion resulting from mutilation; (4) severe disfigurement or speech defect as a result of malocclusion.

A unique feature of this New York program is the orthodontic advisory committee. The use of a professional advisory committee is not of itself unique. In fact, cooperation with professional groups is specifically mentioned in title V of the Social Security Act as one of the conditions for approval of state plans. Advisory committees are common but their use is too often of a nebulous and haphazard character. This is not true of the New York orthodontic program. Its advisory committee really works. Not only did this committee define the classification of crippling conditions, but it also determines whether or not proposed cases fall within this classification. Even more valuable is the fact that this committee reviews the cases periodically to judge the progress of treatment. I have observed this committee in action on several occasions and confess to a deep feeling of humbleness in seeing their devotion to the job. Here I think is an outstanding example of professional supervision, by the profession itself, to insure a high standard and quality of care.

There is a great need for the extension of this kind of advisory skill. Matters of professional judgment—such as classification of malocclusions,

whether selected patients fit the classification, the training and experience necessary to qualify participating orthodontists, review of the progress of treatment—require orthodontists. No administrator (unless he is an orthodontist) is qualified to make such decisions. Wide adoption of a plan similar to that in operation in New York would greatly strengthen the services for crippled children in this country.

TRAINING FOR THE GENERAL DENTIST

Since the great bulk of dentists are general practitioners and since the qualified orthodontists are concentrated in a few areas, the problem of getting service to the majority of the nation's children is a dismaying one. Certainly the knowledge and techniques involved in the prevention and interception of malocclusions should be a part of every dentist's equipment. But how to make it so is another matter. There is reason to believe that a relatively small per cent of the practicing dentists take postgraduate work. Neither do they attend many professional society meetings. Even if they did, the majority of dental society programs carry very few orthodontic discussions.

Probably the best approach to training would be emphasis on basic orthodontic principles for undergraduate dental students. These principles should pertain to every phase of dental practice. Unless I am misinformed, the concept that "dentistry is occlusion and all else is subservient" is not yet the foundation of dental education. I do know that preventive orthodontics is now included in most of the pedodontic courses being given to students and practitioners. But, here too, dentistry for children is being treated as a specialty and not as basic dentistry. Rarely is this problem of education in the prevention and interception of malocclusion a simple one; simplest, perhaps, in the area of "how" to do it, but certainly complicated in the area of "why and when." I would think that this "why and when" of preventive orthodontics might involve etiology to the extent of requiring long training and experience. And then we must recognize the money angle. The average dentist has never learned how to collect fees for his advice. Since much of the time involved in the prevention and interception of malocclusion is spent in observation and discussion, the average dentist would find this service a dead loss financially. He is likely to lose interest because the money appears to be in the treatment of a deformity, not in advising about things which cause deformities. There is reason to doubt that many dentists understand that the basis of preventive orthodontics is also the basis of all dentistry and should apply to almost every patient he sees. The problem of training appears to be teaching the fundamentals to the whole broad front of dentistry. And I think this is a responsibility of the orthodontists.

These are broad horizons. But orthodontics cannot afford to take a narrow view, not and be effective as a health service, particularly in the context that health is social and emotional as well as physical. Orthodontics has great possibilities. It can also be said that it has great responsibilities.

REFERENCES

1. Constitution of the World Health Organization, Am. J. Pub. Health **36**: 1315-1323, 1946.
2. Chisholm, Brock: A New Look at Child Health, The Child **12**: 178-181, 1948.
3. Lilienthal, D. E.: TVA-Democracy on the March, New York, 1944, Harper & Brothers.
4. U. S. Congress. Senate. Committee on Foreign Relations. Statement of Hon. Dean Acheson, Sec'y. of State, at Hearings on S. 833, Feb. 8, 1949. Washington, 1949, Government Printing Office.
5. Lippmann, Walter: Today and Tomorrow, Washington Post, Feb. 14, 1949.
6. Chase, Stuart: The Proper Study of Mankind, New York, 1948, Harper & Brothers.
7. Fulton, J. T.: Dentistry's Greatest Challenge: The Emotional Security of Children, J. Den'. Child. **16**: 6-9, second quarter, 1949.
8. LaBarre, Weston: Wanted: A Pattern for Modern Man, Mental Hygiene **33**: 209-221, 1949.
9. Reports of the Committee for the Study of Child Health Services, Child Health Services and Pediatric Education and Supplement, New York, 1949, Commonwealth Fund.
10. Klein, Henry: Orthodontists in the United States, AM. J. ORTHODONTICS **34**: 159-170, 1948.
11. Salzmann, J. A.: Orthodontics as a Public Health Activity, New York State Dent. J. **15**: 140-145, 1949.
12. Fulton, J. T.: Suggested Principles for Public Orthodontic Programs for Children, AM. J. ORTHODONTICS **34**: 777-779, 1948.
13. Moore, G. R.: The Orthodontic Programs of the Michigan State Department of Health With a New Classification of Occlusion for Survey Purposes, AM. J. ORTHODONTICS **34**: 355-361, 1948.

REHABILITATION OF THE CLEFT PALATE PATIENT

WILLIAM G. HOUGHTON, D.D.S., WATERTOWN, N. Y.

THE origin of this presentation was an aftermath of orthodontic treatment for two cleft palate patients. Strangely enough, both of these children presented themselves almost simultaneously and with considerable similarity as to surgical history and general orthodontic propensities. They were similar also in the fact that both had marked cleft palate speech, and it was very difficult to understand what they were saying. However, their mental attitudes were quite different. The boy, whom I will refer to as *Jack*, was the brusque, swaggering "tough guy" ready to square-off at a moment's notice. Around the office he became known as "fightin' Jack." It seemed to be his way of trying to cover up his handicap. The girl, however, who will be referred to as *Rogene*, presented a truer pattern of the mental complex usually associated with cleft palate affliction. It was her custom to slide into a corner of the office unobserved, if possible, and bury her face in a book or magazine. Her conversation usually consisted of a nod or shake of the head, and it was quite evident that she preferred just to be left alone.

After completing orthodontic treatment for Jack and Rogene, it was obvious that very little had actually been done to raise their social plane or change their inferiority complexes from what they had been at the beginning. This fact was very disappointing to me, and I was determined to do something about it. Armed with case histories, models, photographs, and x-rays, I paid a visit to the "Lancaster Rotary Club Cleft Palate Clinic" and consulted with its director, Dr. Herbert Cooper. Through the kind assistance of Dr. Cooper, we were eventually successful in constructing speech appliances for these two patients and they were then mechanically equipped for speech training.

Without trying to make a storybook ending, I should like to tell you a bit about these young people. Jack was graduated from high school at the age of 16 and is now a freshman at a college of engineering. Because of social engagements and student activities it was almost impossible to get him in for final photography.

Rogene, at 17, is doing postgraduate work in high school and is preparing to enter Cornell University next fall. Last summer she had the honor of being chosen a delegate from St. Lawrence County to the National 4-H Convention in Chicago, where she was a platform speaker.

Cleft palate is rather generally associated with some form of mental deficiency. This is no more true than if a child had been born with red hair. I should like to quote from a manual of the Lancaster Rotary Club Cleft Palate Clinic: "A recent survey conducted by the Chief of the Dental Division of the Pennsylvania State Department of Health, revealed that one in every eight

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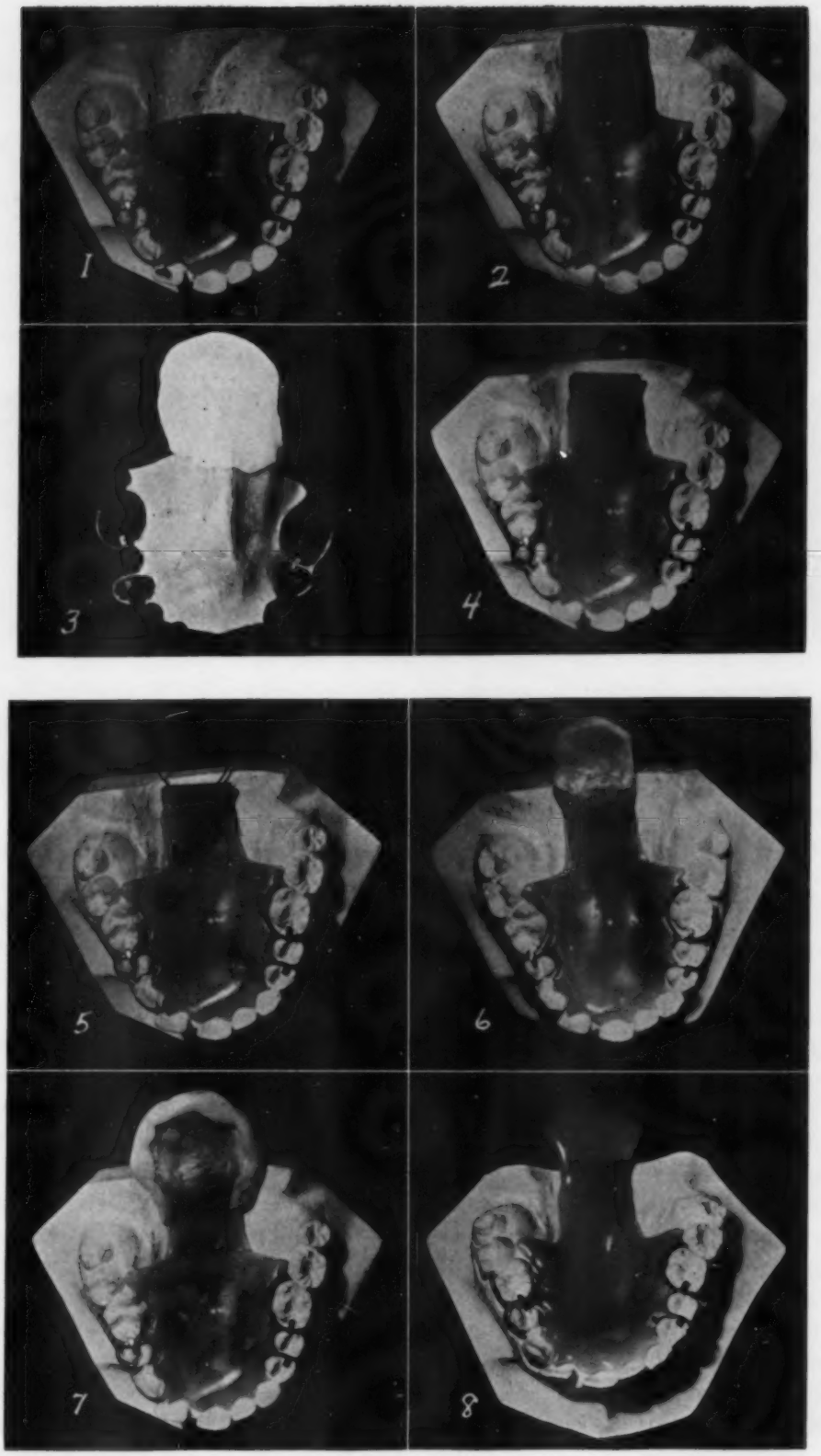


Fig. I.—*1*, Palatal denture—completion of step 1; *2*, addition of baseplate; *3*, impression for extension; *4*, completion of step 2; *5*, wire loop for tailpiece frame; *6*, initial wax form for tailpiece; *7*, addition of wax beading for muscle trimming; *8*, completed speech appliance (step 3).

hundred live births has a cleft palate.'' This would mean that there are roughly 25,000 of these cases in New York State alone.

We all know that malocclusion is usually present in most cleft palate cases. In too many instances surgery alone has been considered as the beginning and the end of cleft palate therapy. It seems to me that as a group orthodontists should assume considerable responsibility in regard to the cleft palate problem, for most of these patients arrive in our offices sooner or later.

We have found that cleft palate cases fall into certain definite categories:

1. The completely successful operative case in which the cleft was successfully closed and normal function of the soft palate restored.
2. The partially successful operative case in which the hard palate may be closed, but in which soft palate function was impaired causing defective speech.
3. Natural clefts, either complete or partial, which for some reason or other were never operated on at all.
4. Those individuals in whom may be present an abnormally short soft palate, resulting in a poor anatomical relationship between the soft palate and the pharynx.

I should now like to turn your attention to the construction of the speech appliance. For this knowledge, I am deeply indebted to Dr. Cooper and his able technician, Maurice P. Gross. In this technical development, there are certain fundamental principles that must be kept in mind.

1. An accurate impression of the teeth and their surrounding tissues.
2. Exact and balanced clasp retention.
3. Passive adaptation of the extension piece over the soft palate.
4. Proper muscle trimming of the impression for the tailpiece which extends into the pharynx.
5. The exact horizontal location of the tailpiece in relation to *Passavant's cushion.* (Passavant's cushion is a certain bulging area on the posterior pharyngeal wall caused by the constriction of the superior constrictor pharyngis.)

Prior to the construction of the speech appliance, it is essential that the occlusion be properly balanced and reliefs provided for clasp rests. For the best results, the appliance is developed in three distinct steps.

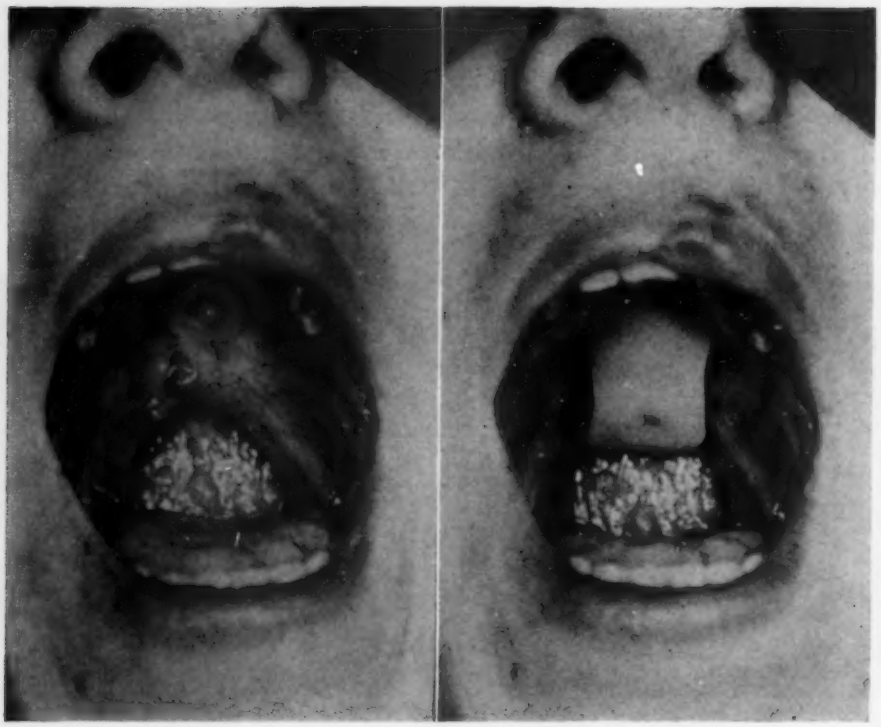
Step 1. Preparation of Palatal Denture.—An accurate hydrocolloid impression is taken of the teeth and the hard palate. This impression is poured in stone and sent to the laboratory with instructions to make a palatal denture carrying a four-point clasp retention and terminating at the distal border of the hard palate. This appliance should be worn for about two weeks.

Step 2. Addition of the Extension.—An ordinary piece of hard baseplate wax is cut about three-fourths of an inch wide and long enough to extend to the posterior border of the soft palate. One end of this baseplate is securely attached with sticky wax to the posterior edge of the completed denture. This acts primarily as a tray for the impression of the soft palate. The denture with attachment is now seated in the mouth, and the baseplate section adjusted to stand away from the soft tissue about two millimeters. After this adjustment, the

appliance is removed, and a layer of some low-fusing relining wax is placed over the baseplate area. The reliner should be softened almost to a flowing consistency by exposing it to the gas flame. After quickly tempering the heated wax in hot water, it is again seated in position, and the patient instructed to close, but not to swallow. The action of swallowing would have a tendency to distort the impression. In a few seconds, the impression is chilled with a stream of cold water. It is now removed from the mouth and sent to the technician to process the extension to the original denture. The denture, as developed, is again worn for about two weeks.

Fig. 11.—Exercises for muscle trimming the tailpiece.

Step 3. Addition of the Tailpiece.—Two small holes about one-half inch apart are drilled into the posterior edge of the extension, and the two ends of a piece of soft brass 0.024 inch wire inserted, thus forming a loop that will extend horizontally into the pharynx. One of these ends should be sealed to the acrylic with sticky wax. The appliance is seated in position, and the loop adjusted laterally and distally to the general shape of the pharynx with ample clearance of all soft tissues. The size of the loop may be adjusted by feeding out or pulling in more wire on the side that has not been fastened down. After sealing the remaining free end of brass wire, we are ready to build the tailpiece. A generous portion of soft impression wax is added to the wire frame and flattened with the fingers to about one-eighth inch thickness. Laterally and distally, the material should nicely cover the loop. It is chilled and tried in the mouth to check the horizontal location in relation to Passavant's cushion. After this adjustment, the denture is again seated, and we are ready for the muscle trimming exercises which should be done immediately. To muscle trim the lateral edges of the tailpiece, the patient is instructed, while sitting erect, to turn his head as far to the left as possible, and then tip the chin down sharply. This exercise is repeated for the right side. The distal periphery is muscle trimmed by asking the patient, while sitting erect, to tip the chin straight downward as far as possible. The impression is chilled with a stream of cold water and removed for inspection. If there is evidence of a discrepancy in the muscle



1. *2.*

3.

Fig. III.—*1*, Soft palate of cleft palate patient (note heavy scar tissue); *2*, same case with speech appliance inserted; *3*, horizontal aspects of speech appliance shown in *2*.

trimming, a little more wax is added to that particular area and the exercises repeated. The appliance is now sent to the laboratory for final processing.

To understand the technique better, the reader may refer to Figs. I, II, and III.

Even after the appliance is completed it may often be necessary to add more acrylic to the tailpiece, and in some cases it may be essential to attach a complete new one. After the patient has had a few days' training, the speech teacher will know whether or not it is going to be successful.

Before I conclude, I would impress upon you the necessity for the closest teamwork between the prosthodontist and the speech instructor. A mechanical genius may build a fine musical instrument, but without the skilled teacher of music the instrument would be useless. So it is with a speech appliance in its relation to the cleft palate pupil.

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REHABILITATION OF THE CLEFT PALATE PATIENT

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DR. HOUGHTON has discussed certain aspects of the speech appliance technique for the correction of cleft palate speech. I wish to discuss the *use* of this appliance.

Let us first consider "What is cleft palate speech?" and "How does it differ from normal speech?" First of all, cleft palate speech is characterized by excessive nasal emission of voice and breath. Second, if we analyze what we hear we are struck by the absence of mouth pressure and by the lightness and softness of the articulation. The combination of these two factors renders cleft palate speech unintelligible in many cases and sadly defective in all. Truly, we are dealing with oral cripples in every sense of the word.

It now becomes necessary to turn our attention very briefly to certain pertinent factors in the English language. As you know, we have two main elements in our language, namely, vowels and consonants. A vowel sound is voice shaped by the position of the jaws, lips, and tongue and delivered through the mouth. These vowel sounds require more or less mouth pressure and the normal speaker closes the posterior nasal port during their delivery. Consonants have many special characteristics. Some consist solely of breath forced through more or less constricted openings such as *F* and *S*; some consist of a vibrating air stream again forced through constricted openings such as *V* and *Z*; some are instantaneous in timing and explosive in character such as *T* and *P*; and, finally, we find some to be continuous in nature such as *Th*. However, all consonants, with three notable exceptions, require mouth delivery and mouth pressure which, of course, means the closure of the back of the nose. To keep the record clear these exceptions are the three nasal resonant consonants *M*, *N*, and *Ng*. These are poured directly through the nose, the mouth cavity being blocked by the lips or tongue and the soft palate being lowered. Speech then requires the functional independence of the mouth from the nose for all vowels and all consonants except as noted. Think what this means for a person with a cleft palate. Every vowel in every syllable will be nasalized to a greater or lesser degree; all consonants will be defective, and the more pressure required of a consonant, the more difficult its pronunciation. Thus, it will be readily appreciated why a person with a cleft palate will show such mutilation in speech.

Next we shall consider the mechanism by which the normal person is able to accomplish this functional partitioning of the mouth from the nose. The simultaneous contraction of the muscles of the soft palate, together with the muscles of the upper pharynx, results in the elevation of the soft palate against a narrowed opening in the region of the nasopharynx. The contraction of the

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upper pharyngeal muscles results in a wrinkle or ridge which extends toward the center in a horizontal plane, known as Passavant's pad or cushion. This sphincterlike action of the pharyngeal muscles is the critical factor in the speech appliance technique. The tailpiece of the appliance must be so positioned and of the proper size so that these muscles are able to reach out and make positive contact. This contact will be with both the lateral and posterior surfaces, thus making an airtight functional block. The use of an appliance makes unnecessary any action of the soft palate. In patients in whom the soft palate is still cleft, the body of the appliance fills the aperture; in cases of surgical mutilation the soft palate is probably functionally inoperative and merely rests on the upper surface of the appliance.

Now comes the problem of training the student in the use of his appliance. My practice is first to explain carefully the mechanics involved. These students, many of whom have gone through harrowing operative experiences, are eager to understand their problem. In practice there are two methods of procedure. The first might be termed "indirect" and the second "direct." By indirect procedures I mean that through focusing the student's attention on the redirection of the air stream from the nose to the mouth, by means of ear training with voice exercises, by teaching such activities as whistling and blowing, we get unconscious, automatic contraction of these pharyngeal muscles against the sides and back of the tailpiece at the moment when air pressure in the mouth is desired. It must be remembered that the student has built an auditory picture of his speech which is normal to him however defective it may seem to us. Along with this defective auditory picture is the kinesthetic feel of air and vibration passing directly through the nose during speech. All this is normal to him and has been practiced thousands and thousands of times. To break into this pattern and substitute something new is not easy. I usually like to put these students on conversational silence for several weeks, encouraging them to write rather than speak, as an aid in breaking down these established patterns, meanwhile working them very hard in corrective exercises.

Direct methods, on the other hand, would involve stimulating the pharyngeal muscles by contact stimulation, mirror contraction techniques, and direct efforts at contraction during speech practice. Some of this is helpful and at times necessary, but may lead to awkward and stilted speech with undesirable voice problems and extreme fatigue. We want smoothness and normalcy throughout.

Most cleft palate students have learned compensatory tongue movements and placements which were probably advantageous when they were developed. However, after the construction of an appliance these peculiar articulatory movements are unnecessary and become a nuisance. For example, it is quite common for them to insert the tongue into an anterior cleft and in this way partially prevent the passage of speech through the nose. As the student senses that these movements are no longer necessary, he tends to drop them, but some movements may be very persistent. Along with compensatory tongue movements we usually find facial movements involving the muscles

along the wings of the nose. The student is trying desperately to stop the passage of speech through his nose and develops a grimace which is very noticeable. Once again we find that as soon as the need for this facial effort no longer exists, because of the closure in the pharynx, these now purposeless movements tend to fall into disuse. Traces may remain but the tendency is toward the normal. It is interesting to watch the gradual disappearance of some of these habits.

Before turning to the recordings, which will conclude my presentation, may I also emphasize the need for cooperative effort on the part of the prosthodontist and the speech correctionist. For either of these specialists to undertake this problem alone would be futile. Obviously a properly fitting speech appliance is the first essential; but of equal importance is corrective speech training. The student, too, must be induced to cooperate in the fitting and wearing of the appliance and later must be stimulated to intelligent and sustained effort in corrective training. The combined efforts of both specialists may be necessary to spur a student to maximum effort. You must realize that many of these oral cripples are badly beaten from a psychological standpoint and need encouragement and hope.

NAIL BITING—A REVIEW

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INTRODUCTION

Statement of the Problem.—Nail biting is a very interesting subject. First of all, so many people (adults as well as children) bite their nails. Second, the reason why people bite their nails gives us a good deal of insight and understanding of why and how we acquire our habits. Most school children bite their nails at some time in life (Wechsler, 1931; Billig, 1941). Pearson (1948) found that over 80 per cent of the inductees of World War II examined by him were actual or former nail biters.

Nail biting may become a problem when it is so vigorous and persistent that it results in the destruction of the free margin of the fingernail, leaving tags of soft tissue which suffer from repeated attacks of paronychia. Where the act is of long duration, callosities of the fingers, deformities of the nails, involvement of the mouth (herpes and gingivitis), and dental trauma have been reported (Schwartzman, 1939).

The physical effects of nail biting, however, are not as damaging as the emotional conflicts from which the habit arises and to which it may lead. From the review of the literature, it will be apparent that the emotional trauma far outweighs the physical damage in importance. The act of nail biting becomes much more significant when it is realized that nail biting per se is a *sign of internal tension*. In addition, nail biting, whatever the cause, may *lead to emotional conflicts* since it is not socially acceptable to parents, teachers, and other persons in authority. These individuals have arbitrarily placed the stamp of "undesirable" on the practice of the act so that the nail biter soon becomes a thoroughly persecuted individual with a vague feeling of guilt from which may stem a variety of neurotic tendencies. Thus, both the emotional as well as the physical aspects of the problem must be given due consideration.

Purpose of This Paper.—The major purpose of this review is to evaluate the literature on the subject of nail biting in an attempt to answer the basic questions: (1) Is nail biting "normal" or is it "abnormal"? (2) What is its significance?

Incidental to these major objectives it becomes necessary also to consider (a) the frequency of nail biting, (b) the causes of nail biting, (c) its origin and course, (d) the dental effects of nail biting, and (e) the management of the nail biting.

As is true of all habits, the act itself is less important than the actor. The significance of the act and its cause are more important than its physical effects. Unless the cause, pattern, frequency, and course of nail biting are analyzed and

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taken into consideration, it is not possible to differentiate between "normal" and "abnormal" nail biting and the normality or abnormality of the nail biter. The present review was designed to bring together the present findings and interpretations of nail biting and some logical sequence which would permit a better understanding of the act in relation to the total physical growth and emotional development of the child.

DESCRIPTION OF NAIL BITING

According to Billig (1941), the act of nail biting appears to follow a sequence of four distinct postures:

1. Placing of either hand in the vicinity of the mouth. This posture continues from a few seconds to half a minute.
2. Rapidly tapping the finger against the anterior teeth.
3. A sequence of quick, spasmodic bitings, the nail of the finger pressed tightly against the incisal edge of the anterior teeth.
4. Removal of finger from the oral cavity. The finger is inspected visually or palpated.

During the entire sequence, the facial expression is rather serious. If the biter becomes aware of being observed, the activity is brought to a sudden end with what is apparently an accompanying sense of guilt. The feeling of guilt is probably the result of the condemnation of the action by society. Severe nail biters often find it difficult to discontinue the act even when ridiculed. As a consequence, they find themselves pushed more deeply into conflict with their immediate society and plagued with an unresolved problem.

TABLE I

		NUMBER OF CHILDREN EXHIBITING THE "HABIT"
Oral habits	(Sucking thumb, sucking fingers, biting nails, protruding tongue)	247
Nasal habits	(Picking nose, scratching nose, wrinkling nose)	127
Hirsute habits	(Pulling and twisting hair, scratching head)	105
Ocular habits	(Rubbing eyes, blinking eyelids, winking)	69
Aural habits	(Pulling ear, picking ear)	48
Genital manipulations	(Manipulating genitalia, thigh rubbing)	17
Total number of habit actions in 459 children		613

FREQUENCY OF NAIL BITING

Prevalence of Nail Biting.—There is almost complete agreement among investigators that nail biting is widespread among children. Olson (1929) made an extensive inventory of "nervous habits" and found that the oral habits were the most frequent mannerisms. Table I from Olson (1929) states the relative frequency of "nervous habits" observed in 459 grade school children.

Nail biting was one of the most frequent of the oral habits observed in school children, being second in frequency only to thumb-sucking. All authori-

ties consulted (clinicians and texts), as well as investigators, agreed on this point (Berillion quoted by Hassin, 1923; Blount, 1931; Dunlap, 1932; Holt, 1940; Chapin and Royster, 1933; Bakwin and Bakwin, 1942; Kanner, 1946).

1. *Nail Biting in Preschool Children (2 to 5 Years).*—

Inception of nail biting: Nail biting does not occur in children less than 3 years of age (Wechsler, 1931; Foster and Stebbins, 1929; Tilson, 1929). Wechsler (1931) showed that the act is first manifested during the fourth and fifth years of life, the incidence rising from zero at 3 years to about 25 per cent at 5 years.

The fact that nail biting is unusual in children less than 3 years of age, but relatively common after 5 years of age, indicates that the act may be considered as a common if not normal mannerism after 5, but as an unusual, if not abnormal, mannerism before 3 years.

Relation to thumb-sucking: Many authors (Wechsler, 1931; Stevens, 1932; Levy, 1937; Spock, 1946; Bakwin, 1948; Massler and Wood, 1949) have demonstrated clearly that thumb-sucking has its greatest frequency from birth to about 3 years of age, tapering off sharply thereafter so that it becomes uncommon after 5 years of age. Thumb-sucking is normal in the infant, but must be regarded as a symptom of emotional regression in the 5- to 6-year-old child (Massler and and Wood, 1949).

Thumb-sucking after the age of 3 years is for some reason regarded as highly undesirable by parents (and even practitioners). Parents will resort to forcible means to cause the child to stop sucking his thumb. Based on (a) the chronologic relationship of the phenomena of thumb-sucking and nail biting and (b) clinical appraisal and longitudinal study of children from 2 to 5 years of age, Wechsler (1931), Levy (1937), Bakwin and Bakwin (1942), Billig (1946), Massler and Wood (1949), and others suggest that *nail biting is a transfer from a frustrated or condemned thumb-sucking habit.* This hypothesis is logical and, on the basis of the data presented, entirely tenable. This theory also serves to explain the great prevalence of nail biting in children over 5 years of age and, therefore, its "normality" at that age. Since thumb-sucking is such a universal phenomenon in infancy, the transfer habit, nail biting, is also likely to be prevalent. Thumb-sucking is "normal" for the infant (Massler and Wood, 1949); therefore, nail biting may similarly be "normal" for the school-aged child.

2. *Nail Biting in Grade School Children (6 to 14 Years).*—Wechsler (1931) investigated nail biting in approximately 3,000 children, ranging from 1 to 17 years of age. He found that the percentage of nail biters increased markedly and suddenly from the age of 3 to the age of 6, after which it remained at a fairly constant level (circa 33 per cent) until puberty. At puberty the percentage of children exhibiting nail biting rose sharply to a peak at 13 years of age (43.6 per cent of boys and 44.4 per cent of girls).

Wechsler did not describe the method used to determine the presence, absence, or degree of nail biting, so that his criteria on nail biting are not clear. He presented only a tabulation of the percentage of children who bit their

nails at each age period. While his data are therefore relatively crude, they are nonetheless the most complete and valuable in the literature.

Schwartzman (1939) observed the occurrence of nail biting in a group of 709 children, ranging from 1 to 12 years of age. His findings were similar to those quoted by Wechsler (1931). Billig's (1941) investigation of 567 boys and girls in a normal elementary school population showed that approximately two-thirds of the children bit their nails at some time and that half of the nail biters stopped the act at about the age of 15 years. Shahovitch (1945) stated that nail biting among school children begins in the first grade and that the number of nail biting children increases until the sixth grade. According to Shahovitch, few children acquire this mannerism after 12 years of age.

From these studies, it would appear that the percentage of children who bite their nails increases sharply from 3 to 7 years of age, remains fairly constant from 7 years until puberty, rising again to a peak of approximately 43 per cent at puberty. The criteria of assessment, however, were not standardized and there is therefore a tendency for wide variations in the figures presented from different studies. The more complete studies are those carried out by Wechsler in 1931 and Billig in 1941. Other studies have been only confirmatory. From these studies it must be assumed that, because of its wide prevalence, nail biting is "normal" in children from 4 years of age to puberty (and later). "Normality" in this sense indicates averageness rather than "desirable" or "ideal."

3. *Nail Biting in High School Children (15 to 18 Years).*—The frequency of nail biting after the grade school level (15 years) begins to decrease progressively with increasing age. Wechsler's studies (1931) showed that the incidence of nail biting after the grade school level quickly drops from approximately 43 per cent at 11 to 13 years to 15 to 19 per cent at the age of 16. Billig (1941) studied high school sophomores (aged 15 to 17) on three occasions and found the incidence of the act to be 20 per cent, 25 per cent, and 29.4 per cent. In addition, Billig pointed out that approximately *one-half or more of the nail biters had desisted by their fifteenth years.*

From these studies it is clear that nail biting decreases rapidly after the age of 15. At this age, the child is becoming sex conscious and social conscious. This type of social disapproval, especially by members of the opposite sex, forces the nail biter to transfer to a less obvious and more acceptable mannerism.

Substitution for nail biting: The censure of friends makes it expedient for the average gregarious child to substitute some other "habit" for that of nail biting. These transfer "habits" range from the relatively innocuous pencil biting and gumchewing to the more surreptitious lip biting, nail picking, and nose picking. Gumchewing has achieved its present popularity because it offers a socially acceptable method of oral gratification. In fact, it is a good method of "transferring" habitual nail biting.

In the adult, smoking is a common nail biting substitute. The cigar sometimes replaces the finger in the adult's need for oral gratification.

Thus, when nail biting becomes unacceptable to society, there are numerous other oral habits to which the child may transfer, such as lip biting, pencil chewing, and gumchewing. Hair twirling, nose picking, and even "doodling"

are considered "transfer habits." Billig's (1946) explanation for such transfers as "equivalent mannerisms" which are more consistent with the personality of the child is logical.

Degree of nail biting: Unfortunately, none of the studies cited paid any particular attention to the degree or severity of the nail biting among the different children. This would assume that mild and occasional nail biting has the same significance as severe and persistent nail biting. This is obviously a false assumption. It would be very desirable to standardize some method of assessing mild, moderate, and severe degrees of nail biting. Such a method would aid considerably in determining the significance of the action and its "normality."

It may be assumed, on the basis of the prevalence studies reviewed previously in this communication, that a mild degree of nail biting is entirely "normal" at the high school level. It cannot be assumed, however, that this is also true for the severe, persistent nail biter at any age level. Certainly, the severe nail biter who tends to persist in this habit *after* the sixteenth year must be viewed with some suspicion. Persistent nail biting after the age of 16, like persistent thumb-sucking after the age of 6, may indicate emotional and social immaturity or regression by reason of emotional traumata which have produced feelings of insecurity and anxieties (English and Pearson, 1945; Massler and Wood, 1949).

4. *Nail Biting in Young Adults (18 to 30 Years).*—Pennington and Mearin (1944) and later Pennington (1945) studied a group of 6,946 white Naval inductees and volunteers, 17 to 37 years of age. Pennington found that at the ages of 17 and 18, one male out of four revealed the mannerism; at 30, the ratio was one in nine; at 37, the incidence was one in twelve. The figures obtained in the age range 31 to 37 years were not valid because of the small numbers in this age group.

Coleman and McCalley (1948) found that approximately 25 per cent of the men and women (16 to 28 years of age) in a college population were nail biters. The authors failed, however, to give the lower age limit of the group.

These studies in young adults indicate a slightly greater frequency of nail biting than would be inferred from the studies of high school children by Wechsler (1931), Billig (1941) and Schwartzman (1939). It is clear, however, that the incidence of nail biting does decrease significantly after the age of 18 years. Hill (1946) examined 1,571 white male Naval separatees (ages not recorded) and found that only 6 per cent of these men bit their nails. However, his criterion for "nail biting" was undoubtedly more exacting than that used by the other investigators. The incidence figures quoted in Pennington's excellent studies indicate that by the age of 30 years less than 10 per cent of men bite their nails. The prevalence in women is probably much lower. Such a low prevalence rate may indicate that nail biting, except the very mildest kind, should be considered "abnormal" in the young adult. Such persons are nonconformists and have not been able to obey the restraints imposed upon them by society. The act of nail biting after the age of 18 years should be considered to be more than merely a habit.

5. *Nail Biting During Middle Age.*—There have been no studies of nail biting in middle-aged persons except for Pennington's study of inductees just cited. Nonetheless, it can be stated without serious fault that nail biting is extremely rare in middle age and, by inference, should be considered as "abnormal" after the age of 30 years.

SEX DIFFERENCES

Some authors (Olson, 1929; Viets, 1931) found a significant difference in nail biting between boys and girls. Others (Billig, 1941; Coleman and McCalley, 1948; Blatz and Ringhind, 1935; and Hattwick, 1937) contended that no difference exists except that boys tend to *persist* in the habit longer than do girls.

FAMILIAL TENDENCIES

Some writers have indicated a familial tendency in nail biting, probably on the basis of the younger child imitating an older sibling or parent (Kanner, 1946; Pennington, 1945; Bakwin and Bakwin, 1942; Billig, 1941; Holt, 1940; Chapin and Royster, 1933; Olson, 1929).

RELATION OF INTELLIGENCE TO NAIL BITING

All investigators who have related intelligence to nail biting agree that no correlation exists between the two factors (Billig, 1941; Olson, 1929; Viets, 1931). Children of low and of high intelligence both bite their nails.

SUMMATION OF INCIDENCE STUDIES

In summarizing the studies of the incidence of nail biting, the following points are significant:

1. Nail biting has its beginnings between the ages of 4 and 5.

2. The incidence of nail biting increases rapidly after the age of 5 and is greatest at puberty (circa 43 per cent). The incidence of nail biting begins to drop rapidly after the age of 15 and is rarely seen after the age of 30 years.

3. Those authors who have considered the origin of nail biting at all agree that the act stems from a condemned thumb-sucking habit and is therefore basically a transfer action. This hypothesis explains the wide prevalence of nail biting, as well as the chronology of its inception.

4. Nail biting was found to be of relatively common occurrence in normal grade school and high school children (43 per cent). The act must perforce be considered "normal" within this age range (4 to 16 years). A *mild* degree of nail biting is to be expected in the average school child and must therefore be considered as "normal."

5. Whether severe and persistent nail biting may still be considered "normal," even during the school age, remains to be determined by future studies which would take into consideration not only the percentage of persons who bite their nails but also the intensity or degree with which they are bitten. It is quite likely that such a distinction may throw additional and important light on the "normality" of nail biting.

6. Nail biting tends to disappear some time during adolescence and is replaced by other more socially acceptable oral habits such as lip biting, gum-chewing, and smoking.

7. Nail biting, in any degree, must be considered "abnormal" below the age of 3 and after the age of 30 years in view of the very low prevalence rates during those ages.

OCCURRENCE OF NAIL BITING IN SITUATIONS OF STRESS

Nail biting has always been considered to be a "nervous habit." It has been inferred that the frequency and degree of nail biting increase in situations of stress or tension. In fact, this relationship has been so well accepted that the phrase "biting the nails" has come to be indicative of a person under stress.

Nail Biting in Children Under Stress.—Situations of stress which may build up inner tensions in children vary widely. There is no question that unfortunate parent-child relationships are the basis for many behavior problems (Spock, 1945). The many scoldings which the child experiences every day produce nameless fears and feelings that he is not loved. Children who feel rejected seek solace in their fingers (Bovet, 1944). Viets (1931) pointed out that nail biting is, in many instances, a *reaction* to a deep emotional strain and is greatly aggravated by unhappy, strained environmental conditions such as those found in broken homes, homes in which harmony was lacking and quarrelling was constant, or in which there was an alcoholic or immoral parent. Homes which were characterized by tension produced a greater number of nail biters. Overprotection and sibling jealousy were also found to influence the production of nail biters.

Children bite their nails in moments of anguish, i.e., fear of not knowing a lesson, reading sad stories, listening to radio horror stories, or upon being "forced" to go to bed at night (Bovet, 1944). Jones (1943) found that school children show increased nervous movements, such as nail biting, nail picking, and other manual and oral movements, under the stress of working arithmetic problems.

Institutionalized Children.—Goldfarb (1943) noted that more than twice as many children reared in institutions had "habits" of nail biting, nose picking, or lip sucking compared to those reared in foster homes. This fact was most evident in the 8½-year-old child. He implied that the institutional environment created more internal tensions than did the foster homes.

NAIL BITING IN ADULTS UNDER STRESS

Adults also experience emotional stresses and anxiety states. A domineering, demanding employer can create a similar situation in the adult that a demanding parent does in the child, with rather equivalent results in unhappiness, regressions, hatefulness, and nail biting. One can commonly observe the strong tendency of adults to place their fingers in their mouths and to bite them occasionally at prize fights, ball games, and other vigorous sport contests—even via television.

Pennington (1945), after examining almost 7,000 military inductees and discovering the wide prevalence of nail biting in young adults, pointed out the importance of tensions in fostering the habit. "Obviously, the number of situations inducing this mannerism is large. Economic, social, familial, sexual, and

all other bases for conflict and frustration have provided, among the thousands interviewed, a fertile ground for the generation of tensions.''

During the recent war an opportunity was offered to study the effects of environmental stresses and emotional strains upon the behavior patterns of men during and after combat (Hill, 1946; Grinker, et al., 1946). Hill (1946) found that nail biting occurred most frequently when the men were in tense emotional situations or during periods of enforced inactivity.

All authors agree that nail biting increases in prevalence and in degree under situations of emotional tension (Pennington, 1945; Hill, 1946; Grinker et al., 1946). The adage that persons under tension ''bite their nails'' seems to be true.

OCCURRENCE OF NAIL BITING IN ABNORMAL PERSONALITY TYPES

Nail biting, especially severe, persistent nail biting, has sometimes been considered a ''neuropathic trait'' rather than a ''habit.'' A sizable literature has therefore accumulated concerning the occurrence of this mannerism in *abnormal personality types.*

Nail Biting in Abnormal Children.—

Delinquents: Michaels (1940) studied a group of 105 delinquent children and their sibling controls. The raw data were obtained from Healy and Bronner (1936) and analyzed statistically. They found that 11.7 per cent of the delinquents and 6.7 per cent of the nondelinquents were nail biters. Statistical analysis of these data, however, showed that this was *not* a significant difference. Conversely, Shahovitch (1945) stated that the majority of juvenile delinquents were nail biters. She did not present data to support this thesis. Thus, while there seems to be a division of *opinion* as to whether more delinquent children bite their nails than do nondelinquents, the only objective study available for analysis indicates that no real difference exists between these groups.

Enuretics: Anderson (1930), while studying the psychiatric aspects of enuresis, noted that nail biting occurred in 68 per cent of the enuretic girls and 41 per cent of the enuretic boys. Anderson concluded that nail biting appears to be an outlet for emotional tensions arising from the conflicts incident to enuresis.

Michaels and Goodman (1934) studied a group of 475 enuretic children, aged 6 to 19 years, in an attempt to correlate enuresis with other ''neuropathic traits'' such as temper tantrums, stuttering, and nail biting. Although 51 per cent of these children were nail biters, nail biting was not found to enter significantly into the statistical association with enuresis. Nevertheless, the authors concluded that there is a ''natural'' clinical correlation of these ''neuropathic traits'' with enuresis, which indicates a symptom complex rather than causal relationship among these traits.

Viets (1931) found that although a slightly greater number of enuretics were found among nail biters than among nonnail biters, the difference was too slight to be significant.

Thus, nail biting and enuresis appear to be associated only as different aspects of a ''symptom complex'' but are not necessarily related except inasmuch

as nail biting may be one of the outlets for the tensions found in the enuretic child.

Stutterers: Oral habits were found to be common in a group of 50 stuttering children, aged 6 ½ to 15 years (Despert, 1946). Thumb- and finger-sucking, common at an early age, were replaced in later years by nail biting. Despert stated that nail biting in this group was a sign of general tension and principally an index of oral tension. The most common finding in this group was anxiety, primary, not secondary, to the speech difficulty. About half of the group showed severe nail biting and nearly all were observed to bite the nails habitually. In this instance, there seems to be little doubt that most stutterers tend to bite their nails severely.

The fact that stutterers also bite their nails illustrates the fact that diffuse anxieties are not solved by any one symptom. Anxieties are probably expressed in a polysymptomatic fashion rather than in any one habit action.

Nail Biting in Abnormal Adults.—The studies of psychoneurotic rejectees and evacuées during World War II (Hill, 1946; Rottersman, 1946) and the findings in schizophrenics and adult enuretics (Bowman and Raymond, 1931; Levine, 1943) showed clearly that nail biting did occur with greater frequency in abnormal personality types and adults with unresolved fears and problems than in so-called normal persons.

It is clear that nail biting is itself not indicative of any abnormality in personality. None of the investigators were willing to consider nail biting per se as a "neuropathic trait," nor was there any real evidence toward that view. All investigators agreed, however, that it was a significant mannerism when considered with *other* "neuropathic traits" (enuresis and stuttering) in the evaluation of the total personality.

At the risk of redundancy, it must be pointed out that even in these rather critical studies, the *degree* of nail biting observed was not clearly stated nor consistently considered. It seems to the reviewers illogical to consider as one both the mild, occasional nail biter and the severe, persistent nail biter. A more careful evaluation is due the "habitual" than the occasional nail biter.

EFFECTS OF NAIL BITING ON THE DENTITION

Nail biting is frequently implicated in the orthodontic literature as a causative factor in the malpositioning of the anterior teeth (Moore, 1948; Markus, 1930; Cartwright, 1935). These references are rather vague and always considered under generalizations such as "habits." While there are any number of subjective opinions, we could discover no objective evidence, clinical or statistical, to prove the thesis that nail biting may cause dental malocclusion. Schwartzman (1939) quoted other authors as having noted dental trauma, gingivitis, and herpes resulting from nail biting. However, this seems to rest more on opinion of what should happen rather than upon direct observations of what did happen.

Only one case was discovered in the literature (Miller, 1931) in which it was shown that *vigorous and continuous nail biting* caused alveolar destruction about the teeth used in biting.

The lack of evidence in the literature leads one to conclude that ordinary nail biting has no serious effects upon the dentition. The reason for this may be the fact that the use of the teeth in nail biting does not differ very markedly from common biting and incising during mastication. This is in contrast to the effects of sucking habits (thumb-sucking, lip-sucking, and tongue-sucking) which frequently do cause disarrangement of the occlusion, especially during the critical mixed dentitional period, 6 to 12 years of age. Incisive forces are transmitted *along* the long axis of the teeth rather than against it, as in sucking. Since the periodontal structures are so arranged as to resist longitudinal forces, no damage results. It may, therefore, be concluded that the act of biting finger nails is physiologic for the teeth and that dental trauma rarely results.

SIGNIFICANCE OF NAIL BITING

Origin of Nail Biting.—Nail biting is apparently a transfer from a frustrated or condemned thumb-sucking habit. The substitution of nail biting for thumb-sucking is almost universal, a fact that can easily be verified in individual cases or in large groups of children.

Many writers have postulated a psychosexual basis for oral habits such as thumb-sucking and nail biting. This viewpoint is based ultimately upon Freud's stages in psychosexual development. One rather clear and complete explanation of this point of view (Wechsler, 1931) stresses the fact that finger-sucking is a complement to nipple-sucking and is therefore necessary to the infant in order to achieve full oral gratification. Nail biting is a continuation of the thumb-sucking habit during the genital phase of psychosexual development of the child and therefore has phallic symbolism. The act of nail biting, like that of thumb-sucking, is therefore an unconscious (and perfectly normal) form of masturbatory activity. However, the act of nail biting in contrast to thumb-sucking carries with it a certain amount of "punishment"—self-punishment in the case of a guilt complex or anger at the parent. For further details of this point of view, the reader is also referred to Menninger (1935, 1938) and to English and Pearson (1945).

Not all writers accept this point of view (Moll, 1924; Billig, 1941; Olson, 1929; Coleman and McCalley, 1948; Pennington, 1945). Most authors agree with the obvious fact that finger-sucking serves a definite need for oral gratification in the infant and agree also that nail biting serves to satisfy a similar need in the older child. They do not feel, however, that it is necessary to invoke a phallic symbolism or genital connotation to the mannerism—that such an explanation is "more concealing than revealing" (Pennington, 1945).

There thus seems to be a definite basis for thumb-sucking in the need for oral gratification in the infant. There also seems to be no doubt that nail biting serves a similar purpose in the child, probably as a result of simple transfer. It seems unnecessary for the purposes of this review to delve deeper into the mysterious depths of the emotions. The serious student, however, would do well to explore this viewpoint further.

Contributory Factors.—The multitude of "don't's" and the strain of living in an adult society and having to conform to it create inner tensions and anxieties in the child. Such stresses increase the frequency and the intensity of nail biting. One must expect the child to "let off steam." Some children react to parental demands by irritable behavior or extreme resistance to control. Others develop bodily manipulations. Nail biting represents one method of tension reduction. It is apparently the most common outlet for inner tensions in the child.

Course of Nail Biting.—A large segment of children bite their nails, but after puberty and adolescence they tend to stop this action. Nail biting may become quickly transferred or lost, or it may become fixed and compulsive, depending upon the attention given to it by parents, teachers, or playmates. In this respect, the emotional constitution of the child plays a great role, since the latter surely determines the character of the reactions of the child toward the condemnations heaped upon him.

The act bears no relaxation to sex or intelligence but apparently tends to become accentuated strongly in those with other neuropathic traits. It is too universal a habit, however, to be regarded, by itself, as a "neuropathic trait." This last may be modified by future studies which consider the severe, compulsive nail biter as distinct from the mild, occasional nail biter.

In the *usual* course of events, nail biting is replaced by other means of oral gratification some time after puberty. In certain instances, however, the habit becomes fixed and compulsive and remains in the adult. At this age, it has been considered indicative of "nervousness" and susceptibility to neuroses (Hill, 1946; Grinker et al., 1946). This has been denied by Pennington (1945).

Significance of Nail Biting.—Basically, nail biting is a tension-releasing mechanism and is therefore indicative of internal tensions. Nail biting may also persist as a residual "habit" long after the situation which caused it has disappeared. Although the wide prevalence of nail biting in grade school children attests to its averageness or "normality," it should not be implied that therefore nail biting is insignificant and unworthy of critical attention. In the total assessment of the child, nail biting is evidence of internal tensions. In most cases, these tensions are the ordinary tensions of the average home and school environments. Nonetheless, their existence should be recognized and, if possible, evaluated.

The severe nail biter should certainly be carefully scrutinized since the very nature of the act must be highly significant and indicative of more than ordinary internal tensions. Severe nail biting at any age level should be regarded with suspicion since it probably represents part of a symptom complex or is the manifestation of unusual inner stresses.

Even a mild or "normal" degree of nail biting merits attention by the pediatrician and the pedodontist who are attempting to evaluate the total personality of the child. The fact that nail biting is "normal" does not necessarily imply that it is "ideal" nor even desirable. It would appear from this review that nail biting is a symptom of internal tensions; that nail biting is a tension-

releasing mechanism. It is assumed that a certain amount of tension in children is "normal," but tensions are not desirable.

The trials and tribulations of childhood are many. All children are subjected to a bombardment of "must's" and "must not's" and live in an environment of frequent frustrations which, if not neutralized by love, inevitably create tensions. When these frustrations and tensions are mild and the child is an adaptable one, a "normal" situation results. If the tensions are severe and the child is not very adaptable, neurotic tendencies begin to appear. Enuresis and persistent nail biting are symptoms and signs of the unresolved conflicts.

From the viewpoint expressed, nail biting even to a mild degree is a significant action inasmuch as it does reflect to some degree the internal emotional status of the child. Nail biting is only one of many symptomatic actions which go to form the characteristic behavior pattern of a particular child. When nail biting activity is evaluated within the total picture of the child's personality, it may (or may not) become a highly significant (or completely insignificant) behavior characteristic.

In summation, it may be concluded that nail biting, like any habitual act or "oral habit," may be normal or abnormal, desirable or undesirable, depending upon the conditions under which it occurs: (1) age of the nail biter; (2) intensity and frequency of the action; (3) relation to the situation in which it occurs; (4) emotional status of the biter.

The real significance of the act depends almost entirely upon the interplay among all these factors. It may be a normal act in the younger child, if mild and not repeated, being a transfer from frustrated thumb-sucking. In the older child nail biting may be a symptom of regression when it is more frequent, more intense, and more damaging. When the action is persistent and very severe, it may indicate that it is a part of a neurotic syndrome. Clinically then, these are all-important considerations which condition one's interpretation of whether nail biting is "normal" in a particular patient. The differences of opinion which exist in the literature are not necessarily divergent when all the facts are molded together in a total, logical, integrated picture. The act of nail biting, to be evaluated adequately, must take into consideration the total personality of the child, his age, the intensity of the action, and its relation to the situation in which it occurs. All these factors must be considered lest we fall into the "bad habit of cataloguing all nail biting as a 'bad habit.' "

MANAGEMENT OF NAIL BITING

Mild Nail Biting.—In cases of mild nail biting "treatment" is usually not indicated and unnecessary. Mild nail biting in the school child is "normal" and to be expected. He will probably "outgrow" it and transfer to some other activity at a later age. Parents and friends should not direct attention to this behavior by scolding, nagging, or condemning it. The danger lies not in the act itself but in its condemnation by the parent with the result that it may become fixed and a focus of conflict between parent and child. If too much attention is paid to the nail biting, the child may subconsciously utilize this habit to focus

attention upon himself. In other words, overemphasis on the habit merely serves to fix rather than to dissipate it.

Severe Nail Biting.—In some instances, children bite their nails excessively and severely. This may indicate excessive internal stresses. A child will bite his nails excessively under conditions of excitement, overstimulation, or unhappiness. Inner tensions may be caused by overt anxiety in the mother, by quarreling in the home, and by expecting too much of the child. One, therefore, should not treat the nail biting, but the cause of the biting. Treatment should be directed toward seeking and *removing the basic emotional factors causing the act.*

In many cases, the only treatment necessary to cure intense nail biting is a little more affection, sympathy, and understanding, with allowances for the child to carry out his ideas without too much adult interference. The child should be allowed more vigorous muscular activity outdoors, such as skating, running, or playing ball. This will, in most cases, dissipate the pent-up energy which otherwise is expressed as tensions leading to nail biting.

Punitive Methods Versus "Reminding" Methods of Treatment.—Harm may accrue from an unintelligent view of the act. Punishment (physical or verbal) for the nail biting may lead the nail biter to social conflict and feelings of guilt. In most instances, therefore, education of the parents is the best "treatment" of nail biting.

All punitive measures, intentional or otherwise, are to be condemned. Procedures utilizing the application of bitter substances or restraints to the finger as punitive measures are condemned by those who are well trained in the emotional aspects of child development. Louttit (1947) stated that such procedures are ". . . even more harmful and contraindicated for nail biting than for thumb-sucking. Therapeutic measures must be aimed at relieving the underlying tensions, and this involves treatment of the child's whole personality."

The use of nail polish painted on the fingernails to remind the child of his biting is very often effective. Bitter tasting substances painted on the nails are regarded as punishment and inevitably fail to help the child, although such treatment may transfer the habit to some other action such as nose picking. Punitive methods are not only useless but injurious because they serve to fix or displace the act.

Isaacs (1933, 1935) discredited negative methods:

"I have accumulated . . . evidence showing the uselessness of negative methods . . . whether these take the form of scolding, whippings, tying the hands . . . or putting bitter aloes on the nails. These methods invariably fail . . . cause misery and a feeling of guilt in the child . . . I have had several cases in which nail biting has been cured by the treatment of the nail with olive oil. The physical effect of olive oil on the nails is an important factor. The oil makes the nails smooth and soft . . . no jagged edges . . . the child has less temptation to tear at them. . . ."

A sympathetic approach to the child or adult, indicating a desire to help (rather than condemn or punish) will usually win the cooperation of the nail

biter, since he does not want to bite his nails any more than society wants to watch him bite the nails. Once willingness and cooperation are won, measures to "remind" the nail biter are generally effective. Simple measures plus suggestion and reassurance are very effective when the child is ready to give up the act. One can use nail polish in the girl; an "expensive" manicure (by a beautician, *not* by the parent) is surprisingly effective. A simple "bandage" to cover the wounded fingers is very effective once the boy (and his friends) are made to understand that this is treatment for the injury and not for the nail biting.

Summary.—A mild degree of nail biting in the school child is common and "normal." Attention and censure merely serve to fixate the mannerism into a habit causing feelings of guilt and insecurity. Severe, compulsive nail biting is symptomatic of increased inner tensions and frustrations. Adequate therapy consists of measures designed to reduce these stresses. Treatment of the symptom alone by the use of punitive devices, bitter substances, or ridicule is generally ineffective and may be harmful.

SUMMARY AND CONCLUSIONS

1. *Occurrence of Nail Biting.*—Nail biting is one of the most common oral habits observed in children and young adults. The act has its incipiency any time after 3 and before 12 years of age. The percentage of children biting their nails rises sharply from 4 to 7 years, changes little between 7 years and puberty, and rises again to a peak during the adolescent years. Nail biting decreases thereafter with increasing age and virtually disappears during adulthood. The incidence among some school children was found to exceed 40 per cent and varies from approximately 10 to 25 per cent among adults.

2. *"Normality" of Nail Biting.*—The concept that nail biting is "normal" between the ages of 4 and 18 years is supported by the high prevalence figures during these years. All investigators agree that simple occasional nail biting may be perfectly normal and merits little attention other than the fact that in the total assessment of the child it is evidence of some degree of internal tension. However, severe, persistent nail biting may be a significant symptom of internal tensions. There exists a real need for a clear objective definition and distinction between mild and severe nail biting so that future studies might more exactly coordinate the data.

3. *Etiology and Course of Nail Biting.*—Nail biting may stem from a condemned thumb-sucking habit. This thesis merits further analysis. Nail biting may become fixated and aggravated by parental condemnation. The act may also become increased in intensity by environmental stresses and strains as well as emotional insecurity, fear, or hate. The usual course of nail biting, however, is to become replaced some time during or after adolescence by some other, socially more acceptable, "oral habit," such as lip biting, gumchewing, or smoking.

4. *Significance of Nail Biting.*—Numerous theories emphasized the role of nail biting as a simple tension-reducing mechanism particularly under conditions of situational stress. There is no evidence that simple, mild nail biting

is a "neuropathic trait" nor can the habit be considered as indicative of pathologic personality. It is unrelated to sex or level of intelligence.

5. *Effects on the Dentition.*—Nail biting is frequently implicated in the orthodontic literature as a causative factor in the malpositioning of the anterior teeth. No proof, clinical or statistical, could be discovered to prove (or disprove) this hypothesis.

6. *Treatment.*—Almost all authors agree that symptomatic treatment of nail biting by bitter substances, restraints, scolding, nagging, and threats are valueless and in fact undesirable and even detrimental. Since nail biting is symptomatic in nature, most investigators agree that treatment should be designed to reduce environmental stress, increase the feelings of adequacy, and thereby relieve the inner tensions.

REFERENCES

1. Ackerson, L.: Children's Behavior Problems, Chicago, 1931, University of Chicago Press, vol. 1.
2. Ackerson, L.: Children's Behavior Problems: Relative Importance and Interrelations Among Traits, Chicago, 1942, University of Chicago Press, vol. 2.
3. Anderson, F. N.: Psychiatric Aspects of Enuresis, Am. J. Dis. Child. **40**: 591, 818, 1930.
4. Bakwin, Harry: Thumb- and Finger-Sucking in Children, J. Pediat. **32**: 99, 1948.
5. Bakwin, R. M., and Bakwin, Harry: "Undesirable Habits" in Psychologic Care in Infancy and Childhood, New York, 1942, D. Appleton-Century Company, Inc., pp. 226-229.
6. Berdie, R., and Wallen, R.: Some Psychologic Aspects of Enuresis in Adult Males, Am. J. Orthopsychiat. **15**: 153, 1945.
7. Billig, A. L.: Fingernail Biting: The Incipiency, Incidence and Amelioration, Genet. Psychol. Monogr. **23-24**: 123, 1941.
8. Billig, A. L.: Nervous Habits and Morale, Proc. Pennsylvania Acad. Sc. **16**: 51, 1942.
9. Billig, A. L.: Why Children Bite Their Fingernails, Hygeia **20**: 945, 1942.
10. Billig, A. L.: The Consistency of Fingernail Biting, Proc. Pennsylvania Acad. Sc. **20**: 39, 1946.
11. Blatz, W., and Ringhind, J.: The Study of Tics in Pre-School Children, Toronto, 1935, University of Toronto Press, p. 58.
12. Blount, R. E. B.: Nailbiting Is a Real Problem Even in High Schools, Hygeia **9**: 668, 1931.
13. Bolt, H., and Blatz, W.: Parents and the Pre-School Child, New York, 1929, W. Morrow.
14. Bovet, L.: L'Onychophagie. Contribution à l'étude de la pathologie de la personne (Nailbiting: A Study), Schweiz. Arch. f. Neurol. u. Psychiat. **49**: 39, 1942.
15. Bovet, L.: Quelles Aspects de l'Onychochophagie Chez l'Enfant (Certain Aspects of Onychophagy in Infants), Ztschr. f. Kinderpsychiat. **10**: 167, 1944.
16. Bowman, K. E., and Raymond, A. F.: A Statistical Study of Personality in Schizophrenic Patients, Baltimore, 1931, Williams & Wilkins Company.
17. Bridges, J. W., and Bridges K. M. B.: A Psychological Study of Juvenile Delinquency by Group Methods, Genet, Psychol. Monogr. **1**: 411, 1926.
18. Burt, C.: Incidence of Neurotic Symptoms Among Evacuated School Children, Brit. J. Educ. Psychol. **10**: 9-15, 1940.
19. Cameron, H. C.: The Nervous Child, London, 1930, Oxford University Press.
20. Cartwright, F. S.: Orthodontia, Safe and Sane, INT. J. ORTHODONTIA **21**: 669-703, 1935.
21. Chapin, H. D., and Royster, L. T.: Pediatrics, Baltimore, 1933, William Wood & Company, p. 212.
22. Coleman, J. C., and McCalley, J. E.: Nailbiting and Mental Health, Mental Hygiene **32**: 418, 1948.
23: Coleman, J. C., and McCalley, J. E.: Nailbiting Among College Students, J. Abnorm. & Social Psychol. **43**: 517, 1948.
24. Conn, J. H.: Psychiatric Study of Car Sickness in Children, Am. J. Orthopsychiat. **8**: 130-141, 1938.
25. Despert, L. J.: Psychosomatic Study of Fifty Stuttering Children (Round Table). Social, Physical and Psychiatric Findings, Am. J. Orthopsychiat. **16**: 100, 1946.

26. Dunlap, K.: Habits, Their Making and Unmaking, New York, 1932, Liveright Publishing Corporation.
27. English, O. E., and Pearson, G. H. J.: Common Neuroses of Children and Adults. Emotional Problems of Living, New York, 1945, W. W. Norton & Company, Inc., pp. 195-199.
28. Fishbein, M.: Nervous Habits, Hygeia **9**: 758, 1939.
29. Foster, J. C., and Anderson, J. E.: The Young Child and His Parents, Minneapolis, 1931, University of Minnesota Press, Inst. of Child Welfare Monographs.
30. Foster, S., and Stebbins, D.: Problems Presented and Results of Treatment in 150 Cases Seen at the Habit Clinic for Pre-School Children in Boston, Ment. Hyg. **13**: 529, 1929.
31. Freud, A., and Burlingham, D.: War and Children, ed. 2, New York, 1944, International University Press.
32. Freud, Sigmund: The Basic Writings of Sigmund Freud, Edited by A. A. Brill, New York, 1938, Modern Library, pp. 580-604.
33. Gesell, A., and Ilg, F.: The Child From Five to Ten, New York, 1946, Harper & Brothers, p. 77.
34. Goldfarb, W.: Infant Rearing Problem Behavior, Am. J. Orthopsychiat. **13**: 249, 1943.
35. Grinker, R. R., Willerman, B., Fastovsky, A., and Bradley, A.: A Study of Psychological Predisposition to the Development of Operational Fatigue: II. Enlisted Flying Personnel, Am. J. Orthopsychiat. **16**: 207, 1946.
36. Hassin, G.: Pediatrics, edited by Isaac Abt, Philadelphia, 1923, W. B. Saunders Company, vol. 7, p. 196.
37. Hattwick, L. A.: Sex Differences in Behavior of Nursery-School Children, Child Development **8**: 343-356, 1937.
38. Healy, W., and Bronner, A. F.: New Light on Delinquency and Its Treatment, New Haven, 1936, Yale University Press, pp. 73-76.
39. Hill, Joel M.: Nailbiting, Am. J. Psychiat. **103**: 185, 1946.
40. Holt, L. E., Jr., and McIntosh, R.: Holt's Diseases of Infancy and Childhood, ed. 11, New York, 1940, D. Appleton-Century Company Inc., p. 920.
41. Isaacs, Susan: Social Development in Young Children, London, 1933, George Routledge & Sons, Ltd.
42. Isaacs, Susan: Bad Habits, Internat. J. Psycho-Analysis **16**: 446-454, 1935.
43. Jones, M. R.: Studies in Nervous Movements: I. The Effect of Mental Arithmetic in the Frequency and Patterning of Movements, J. Gen. Psychol. **29**: 47, 1943.
44. Kanner, Leo: "Habitual Manipulations of the Body." Child Psychiatry, Springfield, Ill., 1946, Charles C Thomas, Publisher, pp. 335-338.
45. Kanner, Leo (J. Brenneman): In Practice of Pediatrics, Hagerstown, Md., 1948, W. F. Prior Company, Inc., chap. 13, p. 24.
46. Kawin, E.: Kindergarten Guidance in Public Schools, Am. J. Orthopsychiat. **2**: 243, 1932.
47. Knight, R. P.: Behavior Problems and Habit Disturbances in Pre-Adolescent Children. Weaning and Management, Bull. Menninger Clin. **8**: 188, 1945.
48. Koch, H. L.: An Analysis of Certain Forms of So-Called "Nervous Habits" in Young Children, J. Genet. Psychol. **46**: 139, 1935.
49. Leshan, L.: The Breaking of a Habit by Suggestion During Sleep, J. Abnorm. & Social Psychol. **37**: 406-408, 1942.
50. Levine, A.: Enuresis in the Navy, Am. J. Psychiat. **100**: 320, 1943.
51. Levy, D.: Finger Sucking and Accessory Movement in Early Infancy, Am. J. Psychiat. **7**: 881, 1928.
52. Levy, D.: The Psychiatric Angle of Finger Sucking, Child Development **8**: 99, 1937.
53. Louttit, C. M.: Clinical Psychology, revised edition, New York, 1947, Harper & Brothers, p. 212.
54. Mahler, M. S., Luke, J. A., and Daltroff, W.: Clinical and Follow-Up Study of the Tic Syndrome in Children. Am. J. Orthopsychiat. **15**: 631, 1945.
55. Markus, M. B.: A Review of the Literature Pertaining to the Influence of Habits in Orthodontia, INT. J. ORTHODONTIA **14**: 393, 1930.
56. Massler, M., and Wood, A. W. S.: Thumbsucking, J. Dent. Children, First Quarter, p. 1, 1949.
57. Menninger, Karl: A Psychoanalytic Study of the Significance of Self-Mutilations, Psychoanalyt. Quart. **4**: 408, 1935.
58. Menninger, Karl: Man Against Himself, New York, 1938, Harcourt, Brace and Company, Inc., p. 231-240.
59. Michaels, J. J.: Psychological Interpretation of Delinquency, Am. J. Orthopsychiat. **10**: 501, 1940.

60. Michaels, J. J., and Goodman, S. E.: Incidence and Intercorrelation of Enuresis and Other Neuropathic Traits in So-Called Normal Children, Am. J. Orthopsychiat. **4**: 79, 1934.
61. Michaels, J. J., and Goodman, S. E.: Enuresis and Other Factors in Normal and in Psychotic Persons, Arch Neurol. & Psychiat. **40**: 699, 1938.
62. Miller, S. C.: Effect of Abnormal Biting Habit (Case Report), New York J. Dent. **1**: 385, 1931.
63. Moll, A.: The Sexual Life of the Child, translated by E. Paul, New York, 1924, The Macmillan Company.
64. Moore, G. R.: The Orthodontic Program of the Michigan State Department of Health With a New Classification of Occlusion for Survey Purposes, AM. J. ORTHODONTICS **34**: 355, 1948.
65. Mowrer, O. H.: Preparatory Set (Expectancy): Some Methods of Measurement, Psychol. Monogr. **52**: 43, 1940.
66. Nelson, W. E.: Mitchell-Nelson's Textbook of Pediatrics, ed. 4, Philadelphia, 1945, W. B. Saunders Company, p. 1015.
67. Olson, W. C.: The Measurement of Nervous Habits in Normal Children, Minneapolis, 1929, University of Minnesota Press.
68. Olson, W. C.: The Incidence of Nervous Habits in Children, J. Abnorm. & Social Psychol. **25**: 75, 1930.
69. Payne, A. F.: The Psychology of Nervous Habits, New Zealand Dent. J. **55**: 205, 1939.
70. Pearson, G. H. J.: The Psychology of Finger-Sucking, Tongue-Sucking, and Other Oral "Habits," AM. J. ORTHODONTICS **34**: 589, 1948.
71. Pennington, L. A.: Incidence of Nailbiting Among Adults, Am. J. Psychiat. **102**: 241, 1945.
72. Pennington, L. A., and Mearin, R. J.: The Frequency and Significance of a Movement Mannerism for the Military Psychiatrist, Am. J. Psychiat. **100**: 628, 1944.
73. Pont, A.: Onychophagy, Lyon méd. **116**: 169, 1911.
74. Preston, G. H., and Shepler, W. McL.: A Study of the Problems of "Normal" Children, Am. J. Orthopsychiat. **1**: 245, 1931.
75. Robin, G.: Treatment of Onychophagy, Rev. gén. de clin. et de thérap. **48**: 645, 1934.
76. Robin, Gilbert: L'Onychophagie (Onychophagy), Hôpital **25**: 527, 1937.
77. Rottersman, W.: The Selectee and His Complaints, Am J. Psychiat. **103**: 79, 1946.
78. Schachter, M., and Cotte, S.: Etude analytique de 100 cas d'onychophagie (An Analytic Study of 100 Cases of Onychopagy), Ann. Paediat. **166**: 99, 1946.
79. Scheidemann, N. V.: The Psychology of Exceptional Children, New York, 1937, Houghton Mifflin Company, vol. 2.
80. Schrieber, quoted by Berillion: Onychophagy and Its Psychotherapeutic Treatment, Rev. de Psychothérap. **26**: 273, 1911.
81. Schwartzman, J.: Onychophagy, Arch. Pediat. **56**: 599, 1939.
82. Shaffer, L. F.: The Psychology of Adjustment, New York, 1936, Houghton Mifflin Company, p. 269-271.
83. Shahovitch, G. P.: Don't Scold the Nailbiter, Hygeia **23**: 302, 1945.
84. Spock, B. M.: Avoiding Behavior Problems, J. Pediat. **27**: 363, 1945.
85. Spock, B. M.: Common-Sense Book of Baby and Child Care, New York, 1946, Duell, Sloane & Pearce, Inc., p. 288.
86. Stevens, G. C.: Autobiographical Material Concerning Childhood Environments and Effects on After-Adjustment of One Hundred Recidivists and One Hundred College Freshmen, Am. J. Orthopsychiat. **2**: 279, 1932.
87. Taylor, M.: The Child and the Home, Ment. Hyg. **6**: 746, 1922.
88. Thom, D. A.: Everyday Problems of the Everyday Child, New York, 1927, D. Appleton-Century Company, Inc.
89. Thomson, J.: Clinical Study and Treatment of Sick Children, ed. 5, Edinburgh, 1933, Oliver & Boyd, p. 703.
90. Tilson, M. A.: Problems of Pre-School Children, Contrib. Educ. Teachers College, Columbia University (No. 356), 1929.
91. Viets, L.: An Inquiry Into the Significance of Nailbiting, Smith College Studies in Social Work **2**: 128, 1931.
92. Ward, A.: The Only Child, Smith College Studies in Social Work **1**: 41, 1930.
93. Wechsler, D.: The Incidence and Significance of Nailbiting in Children, Psychoanalyt. Rev. **18**: 201, 1931.
94. Young, F. M.: Psychological Effects of War on Young Children, Am. J. Orthopsychiat. **17**: 500, 1947.
95. Your Child From One to Six, Children's Bureau Publications No. 30, 1945, pp. 91-92, U. S. Department of Labor (Federal Security Agency).

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SOME OBSERVATIONS ON THE HISTORY AND USES OF THE KESLING POSITIONER

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THE history of the Kesling positioner has been adequately documented by its creator, Dr. Kesling, so this paper will dwell only briefly on the subject. However, the use of the positioner is rather intimately related to a group of mechanical and biological phenomena which should be thoroughly understood by all those who make use of the appliance. The bulk of this presentation, therefore, will be concerned primarily with these phenomena and their relationship to positioner therapy.

The history of the positioner begins with the desire of Dr. H. D. Kesling to produce an appliance which would influence all of the teeth to flow into the desired positions without the use of bands or wires. At the same time, he wanted something which would produce proper arch form according to type.

Thus he set to work, at first with the idea of producing something which would bring about complete treatment. After much effort, an appliance was produced which would complete all of the artistic aspects of the case such as minor rotations, space closing, and bite opening. Of course, in order for this appliance to accomplish its purpose, basic treatment has first to be accomplished. In other words, the jaws must be in proper relationship, the cusp and inclined plane relationship of the teeth correct, and gross rotations corrected.

The introduction of the positioner was truly a milestone along the road to the perfection of orthodontic techniques. It made possible refinement of cases which could formerly be refined only by long months of tedious arch wire adjustments. The main advantage of the appliance lies in its simplicity of design. Dr. Kesling has adequately covered its fabrication, so only an outline will be given here. It consists merely of a rubber mold of the teeth in correct occlusion. This correct occlusion is achieved by setting up the teeth much as prosthetic teeth are set up. The teeth from which the setup is made are obtained from the patient's casts. The teeth are sawed from the casts and then set up in correct occlusion. An impression is then made, and it is poured in stone. From these stone models, a rubber mold is made. This is the positioner. If it has been properly constructed, it duplicates normal occlusion.

It was Kesling's original intention that the positioner could be used for the complete retention period. On the West Coast it was used as a retainer for some time after its introduction, but within the last few years many men have felt that the positioner will not allow for the proper stabilization of the teeth in their alveolar processes. The reason for this is quite apparent. Since the majority of positioners are constructed of rubber or some other elastic material, it is an active appliance each time it is slipped over a tooth which does not con-

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form to its (the positioner's) pattern. Since it expends active forces each time it is placed in the mouth, it has been assumed by a great many users that the positioner will not permit the final settling down of a case. It has therefore become common practice to use a positioner for a period of six to eight weeks in order to put the refining touches on a case, and then to shift to regular retainers for the remainder of the retention period. In this way the teeth are allowed to stabilize in their alveolar processes after final correction by the positioner.

In speaking of positioners, it is inevitable that we touch on the subject of retention. As long as orthodontic patients have been treated, retention without relapse has always been the goal. This subject has been investigated extensively from both the biological and the physical viewpoints.

It is axiomatic that if an orthodontic case is completed with the teeth in complete harmony with the facial pattern and with a perfect equilibrium of forces on the denture, and on the individual teeth, no retention would ever be necessary. This, however, is perfection, and since we are but human, we can only strive for perfection even though we achieve it in only a small number of cases. Retention, therefore, is still, and will continue to be, an important part of orthodontic therapy.

It has been stated in various ways that retention in orthodontics is that device by which the teeth are prevented from returning to their former positions. As stated before, if the correction of the malocclusion has established also a new and stable equilibrium of forces upon the teeth, retention would not be at all necessary.

The term "equilibrium" has been used by chemists, physicists, psychiatrists, pediatricians, orthodontists, and others, so it becomes necessary to clarify what is meant by the termn with respect to orthodontics. The use of the term "equilibrium" in orthodontics usually refers to the balance of forces brought to bear not only on individual teeth, but also upon the dentures as a whole. The position of any one tooth in the denture is due to the resultant of all of the forces brought to bear upon it. It follows that since the dental arch is made up of a series of teeth and the positions of each individual tooth are the result of forces brought to bear upon them, then the shape and position of the dental arch are the result of the balance or equilibrium of mechanical forces brought to bear upon it.

To clarify the situation, let us take the position of one tooth as an example. Of course, we know that there are forces brought to bear upon it from an infinite number of directions, but we will consider three of the main forces. These are produced by the lips or the cheeks, the tongue, and physiologic mesial drift.

Now let us pause to see how tooth movement, through orthodontic therapy, will affect these forces. If we move a tooth lingually, then we unbalance the force couple between the tongue and the lips. If we are to prevent relapse, we must move the tooth in yet another direction to achieve equilibrium.

In addition to these local muscular forces brought to bear upon each tooth, we must consider the relationship between the forces brought to bear upon the arch, and the shape of the arch itself. The term "dental arch" literally means an arch. The only real difference between it and an arch used in a building is that in the latter there is no internal force or force which is brought to bear

from within the concavity of the arch. In the dental arch, however, the force of the tongue on the anterior teeth corresponds to a force from within the concavity of the arch.

In the building arch, all of the force is directed from the exterior of the convex surface. As everyone knows, the keystone locks the series of stones composing the arch into a solid unit which opposes these external forces. Unfortunately, in the dental arch, these external forces are not only balanced by the forces within the concavity of the arch or the forces of the tongue, but these lingual forces may exceed the external forces, thus spreading apart the units of the arch.

From this analysis of forces brought to bear upon the dental arches, it is apparent that the very integrity of the arch itself depends upon its position in space with reference to the forces brought to bear upon it. That is to say, there must be a balance between the external forces (lips and cheeks) and the internal forces (tongue). The shape of the arch will conform to the directional resultant of these forces.

If, for instance, an arch is made too wide during treatment then the external medially directed forces will exceed those from the tongue, and the result will be lingual collapse.

Excess lingual movement of lower anterior teeth will have twofold results in the type of relapse. In the first place, the anteriorly directed lingual force will exceed the posteriorly directed labial force. This will result in anterior movement with consequent spacing in the anterior teeth. In addition, if, as is frequently the case, the cuspids are expanded in order to make sufficient space to move the anterior teeth lingually, relapse may be due to labial force in the expanded cuspid region, resulting in collapse of the whole anterior segment.

Again, if we move teeth too far distally in order to make space available to align the lower anterior teeth, subsequent physiologic mesial drift on the buccal segments will result in collapse of the anterior segment.

It must always be borne in mind that an untreated malocclusion represents equilibrium. If a case is to be treated properly, the original equilibrium must be so altered that when the teeth are moved to their new positions, a new equilibrium results. If this were done in all cases, we would need no retention devices. However, the number of cases in which this perfectly balanced new equilibrium is achieved is extremely small.

For the moment, we must assume that a stable equilibrium of forces brought to bear upon a tooth or teeth cannot be achieved practically through orthodontic therapy. Perhaps the main reason for this lies in the fact that we have no practical way of measuring the balance of forces brought to bear upon the teeth and the dental arches. Physically, perfect equilibrium then is, on the basis of chance alone, extremely rare in the completed orthodontic case. If this is the situation, and if the teeth will relapse toward their original positions after treatment, if equilibrium is not established, why do we attempt retention at all? Why do we not take a chance on relapse right at the time of appliance removal?

The theory has been advanced many times that putting retainers on a patient immediately after appliance removal gives the bone a chance to harden

around the teeth. This, according to many orthodontists, will prevent the teeth from relapsing to their former positions, due to the rigidity of the bone which surrounds them.

The validity of this theory is, of course, open to a great deal of discussion. There are cases which appear to resist relapse when the retainers are removed, even though the forces upon the teeth are not in equilibrium. However, there are many more cases which relapse badly when the retainers are removed, due to the fact that the newly acquired set of forces brought to bear upon the teeth is not in equilibrium. For all practical purposes, then, the idea of bone resistance cannot be depended upon to retain the teeth in their new positions in the event a new equilibrium of forces has not been established.

All this does not mean, however, that adequate retention is not of prime importance in orthodontic therapy. It is true that, since the teeth have moved through bone, they will be loose in their new alveolar processes immediately after the appliance is removed. It is, therefore, good practice to place retainers in order to support the tissues while recovery is taking place.

Most retainers are so constructed that clasps and labial wires are strategically placed in order to resist the tendency of the teeth to return to their former positions. This type of construction is, of course, not necessary if a new equilibrium of denture forces has not been established. In a well-treated case the retainer should be constructed primarily as a splint designed to immobilize the teeth against the forces of occlusion.

There are innumerable types and designs of retainers, but all of them have two things in common. The first is that most retainers will hold the teeth in place for as long as they are worn. The second is that, no matter how well constructed the retainer, the case will surely relapse when the retainer is removed, if a new and stable equilibrium of forces has not been established during treatment.

After viewing retention from the standpoint of equilibrium, it becomes apparent that the retainer establishes stability only so long as it is worn, unless equilibrium was established during treatment. The term "equilibrium" has been used many times in the last several paragraphs. This repetition was necessary in order to establish the importance of the subject. We can now begin to see some of the motivation which brought into being the positioner.

In an attempt to visualize beforehand the equilibrium which could be attained through treatment, Dr. Kesling and others advocated the practice of making two sets of models at the beginning of treatment of each patient. One set of these models is used as a part of the patient's record, as is the case in most orthodontic practices. The second set of models is used for a mechanical study of the treatment plan. In this case the teeth are removed from the models by means of a thin band saw similar to the type sometimes used to relieve tight contact points. These teeth are then set up in much the same way that teeth are set up for artificial dentures.

In making this setup, one should strive for several ideals, but the main one of these is equilibrium. It is an easy task to state that a stable equilibrium is required in this setup, but how does one achieve it? In other words, since I

cannot, obviously, measure it quantitatively, how will I know when I have achieved it in the setup? Unfortunately, there is no pat formula for this, but several points can be borne in mind while making the setup.

The first consideration is one which was first brought forth by Nance in which he stated that lower teeth cannot be moved distally without subsequent relapse, unless it can be established that these teeth, in the etiology of the malocclusion, have drifted mesially. If the latter is the case, the lower buccal teeth can be moved distally in the amount of the established mesial drift.

Another point which must be considered is expansion. It has been asserted many times that expansion of the dentures stimulates the growth of basal bone, thus resulting in a newly stabilized position of the teeth. Through vital staining and cephalometric techniques, it has been shown that this assertion is not true. In making the test setup then, expansion in anything but extremely moderate amounts should not be introduced, because, as a means of orthodontic therapy, it is generally unsatisfactory.

A third point, and a very important one to consider, is that the series of alveolar sockets in the line of occlusion can be thought of as a trough. Any teeth that are out of the general line of the trough can be safely moved into it, since the line of occlusion or the trough represents stable equilibrium. The question immediately arises, "If we are to move teeth into the trough, and we cannot move a great amount distally, and we are not allowed a great deal of expansion, how are we ever going to obtain sufficient space to move these teeth into the trough?"

I do not wish to place salt on old wounds, but since I was asked to speak of the positioner, and since the whole theory of the positioner is based on stable equilibrium, I must state that if there is not sufficient space to place all the teeth in the trough, then extraction must be considered.

In setting these teeth up for analysis, it will be noticed, in many cases, that in order to make the upper and the lower casts articulate, not only must the teeth be set up in proper relationship to the bony bases, but also the bases of the casts must be altered from their original anteroposterior relationship. We are all aware that in the correction of most Class II cases, the relationship of maxillary and mandibular dentures is changed, either by mandibular repositioning or by tooth movement.

If this repositioning is purely mechanical, ordinary retainers will not retain the case. On the other hand, mechanically jumped bites can be held with the positioner for as long as the positioner is worn. This, however, is merely putting off the ultimate relapse.

If the Class II malocclusion has been corrected by impeding growth in the upper jaw, and allowing growth to take place in the lower jaw, as has been implied by Kloehn, then the positioner is an excellent retention device. It will be found that in cases of this type, the teeth can be settled into occlusion in the new jaw relationship beautifully by means of this appliance.

From the foregoing, it can be seen that from setting up the teeth for analysis, it is an easy step to mold the setup in rubber. Since this setup represents what we wish for in any particular case, it is only rational to follow this

procedure. This rubber appliance can then be used to achieve the final finish of the case after basic treatment has been completed.

Thus far in this presentation, the advantages of using the positioner have been presented. It would be neither fair nor scientific to end this paper without discussing some of the disadvantages of the appliance.

Perhaps the main weakness of the positioner, according to many of its users, is its tendency to close the bite after only a few weeks of use. It would not be wholly accurate to claim that bite closure in these cases is due only to the fact that the patient is wearing a positioner. However, there are many factors which contribute to bite closure, and faulty positioner construction is one of these.

It must be borne in mind that any errors made in the construction of the positioner will be reflected in the finished occlusion of the patient. If rotations are not properly corrected in setting up the positioner, they will not be properly corrected in the finished occlusion. Elevation and depression of individual teeth in the positioner setup will be seen in the occlusion just as they were set up on the positioner.

It is common practice in the fabrication of the appliance to mount the master models in an articulator and then proceed to open the bite on the pin of the articulator. After this point is reached, the appliance is "waxed up." Most men make this opening about two to two and one-half millimeters. This amount was decided upon because it is thought to approximate the average freeway space. The rationale behind this opening of the bite in the amount of the freeway space is that having a layer of rubber between the occlusal surfaces of the upper and lower teeth will keep the muscles of mastication in a state of tension while the positioner is in place in the mouth. It is supposed that this tension will hold the positioner in place while the patient is sleeping.

This reasoning is not without logic. It is common knowledge that when a patient relaxes, his jaw drops open to physiologic rest position, which gives the freeway space. Any opening beyond this position puts the muscles, on which the mandible hangs, in a state of tension.

This is an excellent reason for the bite opening when fabricating the positioner, but it would seem to me that a layer of rubber between the upper and lower buccal teeth would invite bite closure in the finished occlusion of the patient. The reason for this, of course, is that each time the patient brings pressure to bear upon this layer of rubber, there would be a depressing action of the posterior teeth which would ultimately result in a close-bite.

This would be the case even if the layer of rubber did not exceed the freeway space, since part of the positioner therapy is to bite into the positioner. In most cases I have seen, however, the thickness of this layer of rubber between the posterior buccal segments exceeds the freeway space. When the jaws are opened beyond the freeway space, the muscles of mastication are always under tension, and depression of the posterior teeth will be the result. For those who doubt this point, I recommend a review of the excellent work of John Thompson.

Another very important point to consider before deciding to use the positioner is the patient cooperation. If the positioner is not worn as prescribed, then it is obvious that the desired results are not going to be obtained.

A third objection to positioner therapy, according to some operators, is that the appliance does not close spaces or achieve proper interdigitation of the teeth in many cases. This objection again is a valid one.

Having covered three of the main defects of the positioner, I think it is in order to point out that two of these can be controlled by the operator and that the third, poor results with poor patient cooperation, is just as much a problem in the use of any other orthodontic appliance.

Dealing first with the close-bite problem, it was decided in one of the study clubs in California that after the positioner setup was made, it was good practice to depress the six upper and lower anterior teeth on the setup until a 1 to 2 mm. open-bite was the result in the final waxup of the case. From this point on, the fabrication of the positioner was carried out exactly as before. Due to the anterior open-bite in the setup, when the positioner is completed, the layer of rubber between the incisal edges of the upper and the lower anterior teeth is at least 2 mm. thicker than that between the upper and lower posterior teeth. With this arrangement, wearing of the positioner forces the anterior teeth to strike rubber before the posterior teeth do so. Obviously this will have a depressing action on the anterior teeth rather than on the posterior teeth, thus acting to prevent bite closure.

Concerning the objection that the positioner will not close spaces or achieve proper interdigitation in some cases, I can only say that it is my belief that in many of these cases, basic appliance therapy has not been carried out as it should have been, and too much has been expected of the positioner.

With these remarks, I rest my case for the use of the positioner. It is an excellent appliance for the purpose for which it was originally intended, and if used properly will produce wholly satisfactory results.

MEDICAL CENTER.

IMPROVED DESIGN OF THE SLIDING SLEEVE ATTACHMENT

HOWARD YOST, D.D.S., GRAND ISLAND, NEB.

AFTER first presenting the sliding sleeve attachment[1] and before submitting the improved design, perhaps a brief explanation may be in order concerning its conception, reasons for its use, and the author's experience with it in his own practice. Primarily the inception of this attachment began with the desire for an attachment suitable for fabrication to chrome-nickel alloy anterior bands for use with the twin wire appliance as developed by Dr. Joseph E. Johnson.[2]

Until recently, all existing types of attachments suitable for chrome nickel alloy band technique required either tying to secure the twin wires to the anterior teeth, which is far too time consuming, or the snap type bracket which protruded into the labial tissues causing unnecessary discomfort and irritation. It was felt any improvements in design of this type of an attachment adaptable for use with the above alloys and meeting the requirements of the technique for the twin wire appliance would render this appliance more acceptable for universal use. It also seemed desirable that if such an attachment could have its component parts assembled on the twin wires and on the bands of the teeth, the locking operation could more readily and easily be performed. Upon this premise the sliding sleeve attachment was developed.

The open tube,[3] chrome-nickel alloy, 0.030 inch inside diameter, was selected for the stationary component of the attachment, which was spot-welded to the anterior band material, and a round tube, 0.022 inch inside diameter by 0.030 inch outside diameter, cut the same length as the open tube, for the sliding component. I have used this type of attachment to the completion of several cases and found it to be quite versatile in its reception of the following types of anterior sections of arch wires: 0.010 inch twin wires, 0.008 inch by 0.022 inch and 0.010 inch by 0.022 inch flat wires, and a selection of single round wires ranging from 0.012 inch to 0.022 inch, the 0.022 inch round anterior wire being used as a means of employing occipital traction[4] to either the maxillary or mandibular dentures after alignments of the anterior teeth had been accomplished with the 0.010 inch twin wires.

After having used this type of round sliding sleeve and round open tube as an attachment, a friend[5] suggested that an oval open tube and sliding sleeve to fit would add refinement of design by lessening the labiolingual thickness. During the summer of 1949, in a personal conversation, Atkinson[6] volunteered aid for further improvement through the technical advisory council and development facilities of a manufacturer of orthodontic materials working closely with graduate engineers of the California Institute of Technology. Through this assistance, the improved design of the sliding sleeve attachment is now presented.

The improved open tube and sliding sleeve are rectangular in design in cross section. The change in form renders the attachment slightly less bulky; and

since the new rectangular open tube is fabricated from spring stainless steel, it provides for greater retention of the sleeve in the open tube. At the same time, it allows the same freedom to the twin wires within the sleeve as that which characterized the previous designs, and with greater precision of control over tooth movements.

The illustrations are artists' drawings of the improved design of this attachment.

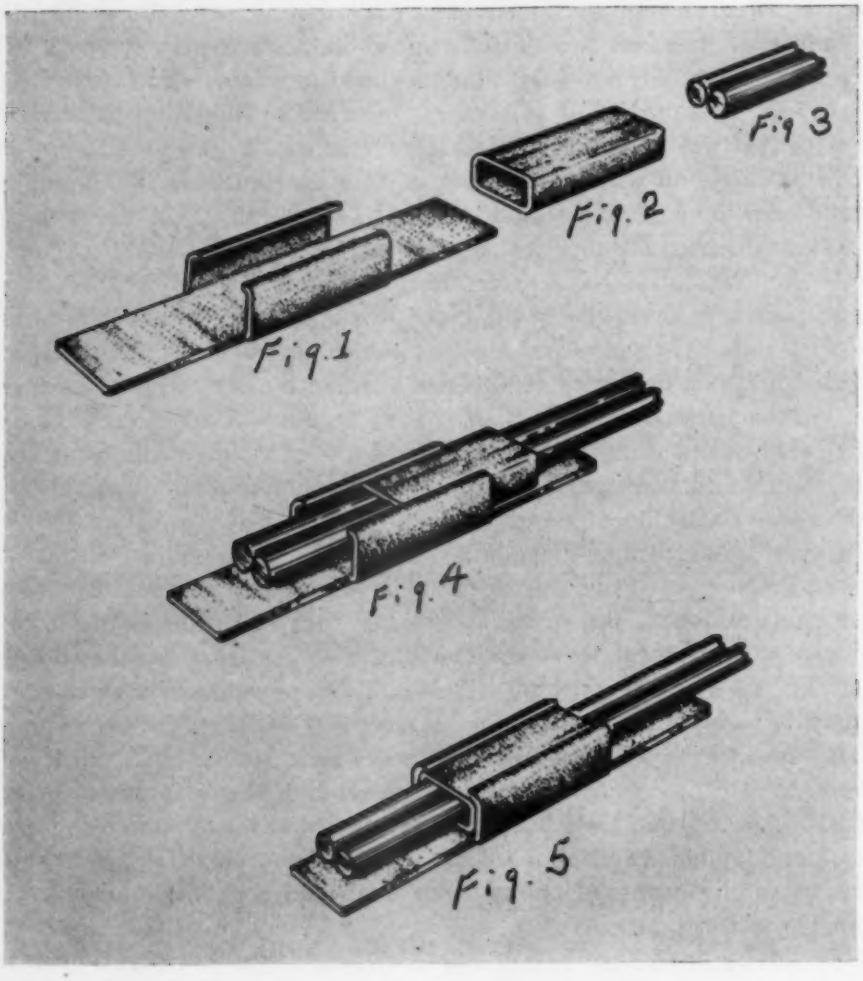

Fig. 1 is a rectangular open tube with extended flanges for spot welding to chrome-nickel steel band material. The rectangular open tube is 0.019 inch by 0.030 inch inside diameter and 0.115 inch long. The open tube is made of chrome-nickel spring steel 0.006 inch thick, making the entire labiolingual thickness of this attachment 0.031 inch exclusive of band material.

Fig. 2 is a rectangular sliding sleeve 0.011 inch by 0.022 inch inside diameter with 0.004 inch wall, making the outside dimensions equal to the inside dimensions of the open tube.

Fig. 3 is a section of 0.010 inch twin wires.

Fig. 4 illustrates the two 0.010 inch wires inserted into the rectangular sliding sleeve, and the sliding sleeve partially inserted into the rectangular open tube.

Fig. 5 shows the complete assembly.

The modus operandi of the improved design of the sliding sleeve attachment is the same as described in the original article.[1]

After the first end tube has been placed on the twin wires, a coil spring of predetermined length is placed on the wires at the mesial end of the first end tube as described in the technique for the Johnson twin wire appliance.[2] The desired number of rectangular sliding sleeves are then placed on the twin wires followed by another desired length of coil springs. Should it be anticipated that additional lengths of coil spring may be needed, two or more additional rectangular sliding sleeves are placed in their stead before placing the last piece of coil spring and the end tube for the opposite side. These additional sliding sleeves will act as free members like additional shorter lengths of coil spring, being placed against the mesial end of a coil spring when progressive movements are desired. In such instances, one or more of the free-acting sliding sleeves become functional locks in the open tubes. The arch wire is then completed by crimping the distal ends and drawing the twin wire mid section to the desired length.

The advantages of the improved design of the sliding sleeve attachment are: (1) less bulky—as mentioned, this attachment has a labiolingual thickness of 0.031 inch which is approximately 30 to 40 per cent less than other locking attachments for the twin wire appliance; (2) more available—the locks are always at hand on the twin wires for ready insertion; (3) more accurate—precise fit of the two 0.010 inch wires in the 0.011 inch by 0.022 inch rectangular sleeve leaves a 0.001 inch clearance in both dimensions.

REFERENCES

1. Yost, Howard: Sliding Sleeve Attachment, Am. J. Orthodontics **36**: 58, 1950.
2. Johnson, Joseph E.: The Twin Wire Appliance, Am. J. Orthodontics and Oral Surg. **24**: 303, 1933.
3. McCoy, James D.: Text, Applied Orthodontia, ed. 3, Philadelphia, 1931, Lea & Febiger, p. 220.
4. Yost, Howard: Adaptability of Occipital Traction as an Adjunct to the Twin Wire Orthodontic Mechanism, Table Clinic, A. A. O. meeting, May, 1949, New York City.
5. Harshman, R. E.: Personal conversation and correspondence.
6. Atkinson, Spencer R.: Personal Conversation and Correspondence.

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Erratum

In the article by A. S. Bumgardner which appeared in the March issue of the Journal, the following footnote should have been included:

Presented at the meeting of the Southern Society of Orthodontists, New Orleans, La., Oct. 30, 31, and Nov. 1, 1949.

The Northeastern Society of Orthodontists

THE Northeastern Society of Orthodontists met in the Grand Ballroom of the Copley Plaza Hotel, Boston, Massachusetts, on March 6 and 7, 1950. This was the third meeting held outside of New York City since the Society was founded in 1923, the first having been in Boston in 1928 when the late Dr. Frank A. Delabarre was president, and the second in Atlantic City in 1947 when Dr. John W. Ross was president.

The Northeastern Society of Orthodontists holds two meetings a year, each of two days in duration. The first, known as the Fall Meeting, is held in November. The second meeting, held in March, is known as the Annual Meeting, when the President's address is presented, all annual business transacted, and the new officers installed. Recently a new plan has been evolved, i.e., in the future to hold the Fall Meeting outside of New York City, the location to be the President's choice, and the Annual Meeting in New York City.

At the Fall Meeting in November, 1949, one of the guest essayists, Dr. Charles H. Tweed, of Tucson, Arizona, presented his philosophy of diagnosis and the trend toward the preventive advantages of early treatment. At the Annual Meeting the guest essayists were Dr. Joseph E. Johnson, of Louisville, Kentucky, Dr. John R. Thompson, of Chicago, Illinois, Dr. Arne Bjork, of Vasteras, Sweden, and Dr. Poul O. Pedersen, of Copenhagen, Denmark.

The meeting was formally opened Monday morning by President Robert H. W. Strang. The first presentation was by Dr. Edward I. Silver, of Boston, on "Ankylosed Teeth." Dr. Silver showed many illustrations of the complications arising from ankylosed or submerged deciduous molars and their successful treatment. Most striking was the alternate treatment and observation of a complicated case over a period of eighteen years, involving both oral surgery and orthodontics, which was brought to a perfect result.

This was followed by a paper by Dr. Joseph E. Johnson entitled, "A Series of Cases Showing the Growth and Development After Normal Occlusion Has Been Established." Dr. Johnson showed a large number of illustrated cases of dentofacial conditions which he had treated in the mixed dentitions between the ages of eight and nine years. He then followed all of these cases with frequent photographic facial studies showing the continued growth and developmental changes over periods of ten and twelve years, until his patients had achieved young adulthood with perfect facial types. Withal Dr. Johnson's presentation was most convincing and conclusive as to the preventive and corrective benefits of skillfully applied early treatment.

The next paper, presented by Dr. Arne Bjork, was entitled, "The Nature of Facial Prognathism and Its Relation to Normal Occlusion of the Teeth." Dr. Bjork presented the results of an exhaustive study of "facial prognathism" as analyzed from cephalometric x-rays of 600 Swedes and 400 primitive South African tribal natives. The summary of his work revealed many implications which have a significant bearing on the trends of present-day orthodontic diagnosis, involving both normal patterns and extraction.

The morning program was followed by a luncheon which was attended by His Excellency, Honorable Paul A. Dever, Governor of Massachusetts. In the role of both host and guest he most affably and genially provided the atmosphere of gracious welcome which made all the visitors feel at home. In his friendly address the Governor evinced a very deep and sincere interest in all matters of public health both by Federal and State agencies, particularly throughout New England. He stated that the health problem was one of the most serious and outstanding ones in the Commonwealth of Massachusetts. He also explained that in preventive, corrective, and rehabilitative measures a large percentage of the State income is expended, and that the necessity for further health protective measures is one of the most important problems in state government.

The Governor was followed by Dr. Robert H. W. Strang who delivered the President's address. His words emanated from a deep knowledge of past and present conditions in orthodontics and a clear insight into the inevitable trends which future progress in a changing world will provide. His recommendations to the American Association of Orthodontists and the Northeastern Society of Orthodontists were later reviewed and officially adopted.

These two able addresses provided a serious but most constructive program of conditions which must be faced squarely in the future.

The afternoon program was opened with a paper by Dr. Helmut A. Zander of Boston, entitled, "Orthodontics and Pedodontists, Collaboration and Competition." He reviewed the problems of growth and development and the necessity for coordination between the orthodontist and pedodontist most vital to the child.

The next paper was "Cephalometric Radiographic Analysis of Dentofacial Disharmony and Malocclusion of the Teeth," by Dr. John R. Thompson, of Chicago, Illinois. This paper described a practical cephalometric radiographic technique as applied to the analysis of a variety of cases.

A business session followed during which the clinics were open to guests only. After the business session the clinics were continued for members only. The clinicians were Drs. John J. Dolce, Leigh C. Fairbank, Clare K. Madden, John Murray, and Eldridge P. Smith.

The program opened on Tuesday morning with a case report by Dr. Walter J. Sly of Boston. He presented an interesting case of an impacted upper cuspid and congenitally missing lateral incisor, with the description of the technique he used in treatment, which was a combination of several methods in use.

There followed a paper by Dr. Herbert I. Margolis, of Boston, entitled, "Some Criteria for Extraction in Clinical Orthodontics." This paper was divided into three principal captions: (a) Physiologic Age of the Patient When Tooth Removal Is Indicated; (b) Selection of Teeth to Be Removed; (c) Principles of Anchorage and Mechanotherapy.

Dr. John R. Thompson presented his second paper entitled: "A Consideration of Malocclusion of the Teeth From the Viewpoint of Function of the Masticating Mechanism." This paper covered a study of the anatomy, growth, and function of the masticating mechanism, also a very fine study of the dynamic concept of occlusion as opposed to the static concept of same. Numerous case

histories and treated cases were presented to demonstrate the contrast between the principles discussed.

After a set luncheon a paper was presented at 2:00 P.M. by Dr. Paul O. Pedersen, of Copenhagen, Denmark. The title was, "Dental Caries and Malocclusion in the Greenland Eskimo: Results of Three Expeditions to East and West Greenland." The discussion was based on studies of 2,500 natives and 525 skulls. Dr. Pedersen's work, as well as the research by other Danish dentists in the Arctic, was most comprehensively presented with slides and motion pictures.

At 3:00 P.M. the Society went into the final executive session during which a second group of clinics was opened to the guests. The clinicians were Drs. Paul L. Cleaves, Albert F. MacDougal, Milton J. Meyers, William J. Speers, Orthodontic Department, Harvard School of Dental Medicine, and Alumni, Department of Postgraduate Orthodontics, Tufts College Dental School.

At the business session final committee reports were made, followed by the election of officers and new members. Dr. Strang again expressed his gratitude to the officers and committeemen who had worked so diligently to provide such outstanding programs and to have made his administration one of distinct success by covering all the branches of modern progress. The gavel was then presented to the incoming president, Richard A. Lowy, who announced the following officers and committees for the ensuing year:

President	Richard A. Lowy
President-Elect	Paul Hoffman
Vice-President	Paul Geoffrion
Editor	J. A. Salzmann
Sectional Editor	Jos. D. Eby
Director	George S. Callaway
Alternate	Clifford G. Glaser
Secretary-Treasurer	Oscar Jacobson
Board of Censors	John W. Ross, Chairman
	Norman L. Hillyer
	Robert H. W. Strang
Executive Committee	Walter R. Bedell, Chairman
	William R. Joule
	Eugene J. Kelly
	B. Edwin Erikson
	Z. Bernard Lloyd
Advisory Committee	Ralph Waldron, Chairman
	Philip E. Adams
	John V. Mershon

The meeting was adjourned with the announcement that the Fall Meeting would be held in the Shoreham Hotel, Washington, D. C., in November.

J. D. E.

Frances P. Bolton Honored

AN EDITORIAL appeared in the JOURNAL some years ago that attempted to reflect some of the debt of gratitude that orthodontists feel toward the Bolton Study.

In 1925, Dr. B. Holly Broadbent, of Cleveland, Ohio, perfected the cephalometer which made possible a standard-sized x-ray study of the child's face from birth on through to early adult life. This necessitated a mass study of normal face growth for the purpose of arriving at conclusions as to exactly what happens when the face and head grow and enlarge.

At about the time that this study was started, in 1929, the Honorable Frances P. Bolton and her son Charles had an active interest in medical research. They became interested in the study of the normal subject and the Bolton Fund was set up and put into operation with Dr. Broadbent as its director.

Month by month thousands of children's faces were x-rayed and these pictures were superimposed one upon the other until an accurate growth pattern was established for the normal expectance of child growth.

These studies were coordinated with the Brush Foundation findings under the direction of the late T. Wingate Todd, which were concerned with the skeletal development and the mental expansion of the child.

The Bolton Study quickly revealed that so-called landmark methods of measuring the head and face were of little scientific value for the reason that ear holes used as fixed points for determining distances from fixed points are not fixed at all but grow downward and forward. These were therefore rendered ineffective as guides for continued study of the subject. The superimposed x-ray method was adopted as the only accurate means of determining face growth, and this was brought out largely by the Bolton Study.

Probably of more important interest is the fact that was established that the face quickly reflects the health of the growing child and that practically all of the so-called diseases of childhood influence the growth patterns of the head and face. That is very important to the orthodontist in his appraisal of expectance of treatment.

It has been shown that crowding of the anterior teeth in some cases is not abnormal, that the teeth have only assumed a temporary position in the growth of the jaws. So important has this study become that orthodontists in many instances have adopted its findings and its principles as standard procedure, and they have become more growth conscious than before the Bolton Study.

Assisting Dr. Broadbent in this research, which produced between forty and fifty thousand plaster casts of children's teeth and an equal number of x-rays, have been Dr. Harold G. Sheakley (died in 1929), and Dr. John W. Richardson (died in 1931).

Many have been heard to ask, "Why is this work so important to orthodontics?" The quick answer no doubt would be, "Because it has diverted orthodontic thinking from the mechanics of orthodontic appliances to the development coordination of the teeth and jaws with the entire head and face."

The Bolton Study has contributed much in a practical way to orthodontic treatment.

This material was digested from an editorial which appeared in the JOURNAL some years ago and is appropriate now because it brings out the Bolton Study in relation to orthodontics.

At the recent child health day meeting of the Cleveland Dental Society, Honorable Frances P. Bolton was awarded an honorary membership in that society in recognition of personal devotion to education and research in the field of health.

The original grant established by the Bolton Fund at Western Reserve University amounted to $35,000 and covered the first five-year period, 1929 to 1934, which provided $5,000 for equipment and $6,000 per year for five-year investigation. From 1934 to date, the annual budget has increased steadily due to increase in operating cost and widening the scope of the investigation, so that to date the Boltons have provided approximately $250,000.

These funds made possible a collection of serial cephalometric roentgenograms of the face and plaster casts of the mouths of more than 7,500 children. Many of these longitudinal records cover the entire time of developing dentition and the face, through the eruption of the third molars.

It is quite obvious that it would not be practical to evaluate two decades of this exacting and exhaustive research. It would require detailed study of tens of thousands of plaster models and x-rays, together with a correlation of the Brush Foundation records compiled by the late Dr. T. Wingate Todd.

Mrs. Bolton encouraged many other institutions to conduct similar researches by providing Bolton cephalometers to the following: University of Illinois, University of California, Northwestern University, Harvard Forsythe Dental Clinic and Harvard Dental School, the Tom Spies Clinic at Hillman Hospital of Birmingham, Alabama, and the Western Reserve University.

Today the Bolton cephalometric technique is taught in all graduate and undergraduate courses in orthodontics and present-day teaching of developmental growth of the face in undergraduate instruction is based largely on findings and publications of the Bolton Study.

This internationally recognized research was made possible through the generosity of a lay person exercising an inherent desire to promote better health and better dentistry.

In order to recognize officially and record permanently this pioneering and invaluable contribution in the field of dentistry, the Cleveland Dental Society presented an honorary membership in the Society to the Honorable Frances Payne Bolton at the Luncheon Meeting of Children's Dental Health Day on Feb. 5, 1950.

Mrs. Bolton's response follows herewith, and it will be of great interest to orthodontists throughout the world.

Dr. Alexander, Dr. Svetlik, Members of the Cleveland Dental Society, and Guests:

It is always difficult to express one's appreciation of such invitations as yours to join with you to celebrate another milestone in the evolution of your eminent

Society. You have done me such a signal honor, gentlemen, that it is even more difficult to find words in which to describe to you my feelings today.

May I say quite simply that I accept the Honorary Membership you have so graciously extended me with a deep sense of privilege, realizing that it marks a very great departure for your Society. I do so with the hope that it may further the close relationship between your splendid membership and the thousands of laymen that you serve.

I shall always consider myself deeply fortunate to have been chosen as a symbol, a key, perhaps, to the door of closer association between you who are professionals in an important health field and those of the laity who, through close contact with individuals among you, have been privileged to hold up your hands, sharing some of your vision, participating in some of your dreams.

It is about a quarter of a century since Dr. John MacLachlan, a brilliant young physician with healing for others in every fibre of his being, though not, alas, for himself, advised me to take my children to Dr. B. Holly Broadbent, now the eminent scientist, the Professor of Dentofacial Morphology at Western Reserve University. "He has rather radical ideas," said the doctor, "but you can trust him."

I did not know then that the trust my boys instinctively felt in him, which I shared, would become perhaps the most dramatic factor in giving back to the eldest of the three interest in living, in doing, when, after a serious diving accident and a consequent severe paralysis, he had to find his way out of a great darkness.

Mechanically inclined, Charles had found Dr. Broadbent's careful watchfulness during the long months in a hospital, when the traction necessary to pull the spine back into place threatened to undo the longer years of work on the growth and development of his face, something different, something, perhaps, to hold on to.

You can perhaps imagine my joy to find, upon our return to Cleveland when the darkness seemed almost impenetrable, that the quiet man who had watched over this phase of Charley's recovery saw the deeper need of the boy's soul and set himself to the task of rekindling the flame of desire in his heart.

Can you wonder, Friends, that I became interested? Do you wonder that when there were needs I was ready to fill them? For Charles was enticed to the basement of the Western Reserve University Medical School week after week—not just to watch, but to work, to take up life again, awkwardly, slowly, but definitely. Thanks to Dr. Broadbent's ingenuity, movie cameras were usable even by awkward hands, and a film, the first of its kind, gave the world an exciting story: the adventure of human teeth. This crude little film has long since taken its place in the historical archives of the Bolton Fund, but it spelled life for a lad who had to find a way out of a great darknees. Thanks to the understanding and vision of his friend, his feet found their way to the first rungs of the ladder of hope.

You can understand that there could be no question of my interest in the work that had been undertaken singlehanded by the quiet young pupil of Dr. Angle.

I tell you this intimate story, Friends, because it illustrates so vividly the human factor in all contacts between the laity and the professional groups and the possibilities that can come out of an understanding that is based upon the deep inner needs of human beings. I do not suggest so extreme a path as that which this son of mine was faced with who continues to surmount every difficulty, proving that life itself is a creative force whose powers of recreation are not yet well enough understood. But I do suggest that mutual need, mutual understanding, and mutual desire have a power of accomplishment as yet unmeasured.

It is not to be wondered at, is it, that as the work progressed I too fell victim to its intriguing and far-reaching possibilities.

We have had the picture of its progress given us—so I shall not repeat, lest I weary you and exhaust my time. But I must pay my own tribute to such men as T. Wingate Todd who shared our enthusiasms and gave us access to the youngsters and the studies of the Brush Foundation, as well as to his own helpful advice and counsel down the years. I must express my own appreciation of the helpful attitude of those in authority in the University who made space available to the Bolton Research. Especially do I want to say just a word about those who have been part and parcel of the work that has gone forward for this quarter century as technicians, as artists, as students. It is not easy work for it must be done with meticulous perfection, the perfection that stems from an inner urge rather than from a superficial knowledge, or a personal ambition.

This research that has established the Bolton Point, that has begun to clarify the understanding of the marvels of the laws governing growth and development of the face and head, that is constantly opening up new vistas not only to the dental profession but also to medicine and psychiatry, and all the new angles of understanding of the wonders of this Temple in which we dwell, who are bits of star dust and tiny particles of the Essence of the Infinite, owes its being not to me, but to the quiet man whose inner urge has kept him at a difficult task, whose scientific methods have attracted to him young men and women without whom he would have had the need of even greater patience than is his. The Bolton Research owes its life to the rare spirit of a true scientist, a man of unquestioned integrity, of undaunted courage, of untiring zeal.

He would be the first to deny this, to give the credit to others, for his is the humble heart of a true seeker after truth for the benefit of man.

Small wonder that the tiny Board had no difficulty in filling Dr. Todd's place when he laid his burdens down! In Dr. Hoerr the Bolton Fund has a strong right arm, a keen brain, and a spirit which soars out beyond Today to the far horizons of Tomorrow's Dawn.

Again do I thank you for the privilege of sharing with you this Children's Dental Health Day. I am always proud of Cleveland's leadership in social betterment. There is a spirit in this great city, indeed in this whole area, that reaches out to make possible to an ever-increasing number of people here and everywhere opportunities of health and happiness.

It must be a deep satisfaction to this membership to have been able to play so vivid a part in bringing to the other professions, as well as to the laity, more

understanding of the vital factor played by dental health in the fundamental health processes of human living. I congratulate you upon your accomplishments even as I urge you to consider them but challenges to further seeking after truth, which in various ways will give to the children of the future stronger bodies, and so clearer minds. That future will demand of all of us and of all of those who are today's children every ounce of their strength, their courage, and their wisdom.

So I say to you on this memorable occasion we of the laity look to you to hew new paths into the unknown tomorrows with the quiet patience, the indomitable courage, and the white vision of science, never forgetting that only as there is increasing understanding by one man of another, one group of another, one nation of another can the people of the world find peace.

In Memoriam

HAROLD C. BEAL
1901-1950

HAROLD C. BEAL died suddenly in Butte, Montana, on Thursday morning, Feb. 23, 1950, at the age of 49.

Dr. Beal was born in Anaconda, Montana, where he attended the Anaconda High School and later attended dental school at Denver University, Denver, Colorado.

His graduate work in orthodontics was at the University of Southern California.

In both his high school and college days he was an outstanding athlete. He participated in football, basketball, and track, and, for a time after his graduation, he served as a coach for Denver University.

He was a member of the American Dental Association and its components and the American Association of Orthodontists and its components.

Dr. Beal leaves a widow, three children, and countless friends who were shocked at his sudden calling.

WILLIAM AUGUSTUS CLARKE, SR.
1892-1950

WILLIAM AUGUSTUS CLARKE, SR., born Oct. 11, 1892, at Jefferson, Georgia, was the son of Alice Hunter Clarke and W. A. Clarke.

He was reared in Athens, Georgia, and attended the Southern Dental College in Atlanta, graduating in 1915. Returning to Athens, he practiced dentistry there until he entered the United States Army and was stationed at Camp Hancock, in Augusta, Georgia, as a first lieutenant. After his discharge he returned to the practice of dentistry at Athens.

In 1925 he did postgraduate work in orthodontics at the University of Pennsylvania, and opened his office for the practice of orthodontics in Atlanta in 1926.

Dr. Clarke was the only southern member of the Scrod Club of Massachusetts, a group engaged in research work which met at the invitation of Dr. A. LeRoy Johnson.

He was a member of the Southern Society of Orthodontists, the American Association of Orthodontists, the Northern District Dental Society, the Fifth District Dental Society, the Georgia Dental Association, and the American Dental Association. He was past-president of the Southern Society of Orthodontists and the Fifth District Dental Society.

He was a member of Pi Kappa Alpha social fraternity and Psi Omega dental fraternity. He was also a member of the Military Order of World Wars, a member of the Masonic Lodge in Athens and Yaraab Temple, Shrine, Atlanta.

He is survived by his wife, Harriet Parker Clarke, and one son, W. A. Clarke, Jr.

THOMAS THOMPSON MOORE, JR.
1880-1949

THOMAS THOMPSON MOORE, Jr., beloved Columbia orthodontist, died May 20, after an illness of several months. Dr. Moore was the son of Dr. Thomas T. and Mary Sawyer Moore and was born in Columbia, March 8, 1880. It was in his father's office that the South Carolina State Dental Association was founded in 1869. Coming from a father who was so deeply interested in the profession of dentistry, there is little wonder why young Tom enrolled in the School of Dentistry, University of Pennsylvania, graduating in 1901.

Soon after taking his degree in dentistry Dr. Tom began general practice with his father and remained with him until 1919 when he took a course in orthodontics at the Dewey School of Orthodontics, New York. He then limited his practice and was one of the leading orthodontists of the State until his forced retirement, due to illness, a few months ago.

Dr. Moore, Jr., was president of the State Association in 1908, the meeting being held at Columbia. He was possibly the youngest dentist ever to become president, and like his distinguished father he was an ardent worker for the Association. The men of the profession today are deeply indebted to this father and son for the advancements we have achieved and the high standards of practice we enjoy today. His ethics were of the highest, his professional conduct beyond question, his ability superb.

He was one of the founders of the Southern Society of Orthodontists, and a member of the American Association of Orthodontists. He was the first dentist in South Carolina to limit his practice exclusively to orthodontics. Although it has been over thirty years since he practiced general dentistry, we still see various types of restorations of his that stand as a monument to his skill.

Services were conducted at Trinity Episcopal Church, of which he was a member, and he was laid to rest in the churchyard.

The elements so commingled in his noble life that Nature might stand up and say to all the world, "This was a man!"

Department of Orthodontic Abstracts and Reviews

Edited by
DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Congenital Malformations After Exposure to Measles in Early Pregnancy: By Hagströmer, *Acta paediat.* **35**: 189-280, 1948.

Hagströmer presents the histories of 2 infants with congenital malformation. One had a harelip and partial cleft palate and the other had cleavage of the back palate, a rudimentary right ear placed a good distance forward on the cheek, and a notably small chin. Both families had been free from such defects, but a brother of the first infant had had measles during the second month of the mother's pregnancy that resulted in the birth of the defective child. In the case of the second infant, 2 cases of measles had occurred in the family while the mother was in the second month of pregnancy. In both cases the pregnant women had remained free from measles, having had attacks during their childhood. Whether or not a causal relationship existed between the siblings' measles and the malformations described cannot be definitely decided.

Prenatal Maternal Factors in Mongolism: By Clemens E. Benda, M.D., J. A. M. A. **139**: 979-985, April, 1949.

In the etiology of Mongolism, two problems must be distinct: (1) the causes leading to the abnormal development of the embryo and (2) the abnormal factors operating in the embryo to produce the characteristic growth disorder. The present study deals only with the former problem, the prenatal maternal condition. Since Mongolism is present at birth and the characteristic anomalies date back to early stages of fetal development, the causative factors are either of a genetic nature or environmental factors operating in the mother during gestation.

In 1939, Benda, Dayton, and Prouty presented a study of 250 pregnancies each resulting in the birth of a Mongoloid child. An analysis of the material produced evidence that Mongolism is not due to genetic factors. The material indicated also that neither a germ mutation nor a primary inferiority of the ova was an acceptable explanation. These conclusions were based on the following facts:

1. The frequency of occurrence of a Mongoloid child increases in proportion to advanced age of the mother. While one Mongoloid child may be expected among 8,000 births if the mother is between 20 and 24 years of age, the incidence increases to 12.5 per cent if the mother's age is between 45 and 47 years.

2. A study of the birth order of Mongoloid children shows that in large-sized families the Mongoloid child is found near the end of the line of siblings. A Mongoloid child was never born at the beginning of a sequence of six to fifteen children, while other congenital defects occur at any place in the birth order.

3. As Macklin and Snyder stated: "... when the sibship consists of five or less, a random group of families will have a majority showing only one affected offspring. It is not until the sibship size increases to six that one would expect more instances of two or more children affected than of one affected."

4. The observations of twins of whom both or one is a Mongoloid are not conclusive.

5. The theory that Mongolism develops from the fertilization of an abnormal "overaged" ovum cannot be entirely excluded by present methods. The material seems, however, to indicate that extrinsic factors, operating at a later date, seem of more importance.

The conclusion was offered that the common denominator for all conditions under which Mongolism develops is a "threshold condition of hormonal sterility."

Since Gregg and a number of other scholars (Wesselhoeft) published their observations on the importance of virus diseases in the production of congenital malformations, the general interest in problems of prenatal health and hygiene has greatly increased. Of all abnormal prenatal conditions, Mongolism takes the largest toll among the normal population; about 3 children in every 1,000 births in a general lying-in hospital are affected with Mongolism. While the importance of prenatal factors for the health of the newborn is increasingly recognized, many pediatricians and obstetricians show a respectful skepticism toward the data so far presented and seem to feel that the material is not yet conclusive.

The 50 new case histories which are presented are the result of fifty-four interviews. Four instances in relatively young women were excluded because no explanation could be found. In the previous studies, about 10 per cent of the cases could not be explained. The remaining 50 cases were divided into four groups according to age.

EVALUATION

Mongolism is not a malformation or "monstrosity" but a deceleration of normal growth during the fetal period from about the sixth to the fourteenth week. At the time of most intensive fetal growth, some factors seem to slow down the growth rate, with the result that certain developments which usually take place in a matter of days are not properly completed. Failure to complete certain basic developments in fetal life cannot be fully corrected in a later period. In Mongolism a temporary retardation or deceleration of growth occurs which makes the Mongoloid newborn infant a physiologically "immature," "ill finished" baby.

In studying the factors leading to such decelerated growth, there cannot be one uniform "cause" because the constellation of factors differs in various age groups.

In the age group of 40 to 52 years, 53.9 per cent of the women were actually in the menopause and pregnancy occurred against expectation. Pregnancy was frequently not recognized until about five months had passed. The fact that these women were beyond the childbearing period is further emphasized by the long interval between previous pregnancies and the last one. With the exception of 2 women with an interval of two and three years, respectively, all intervals ranged from four to sixteen years; 9 women, or 69 per cent, had an interval of seven years or more.

If Mongolism is considered due, not to a single cause, but to a constellation of abnormal factors, it must be realized that in each case there is a concurrence of several symptoms of varying significance. Aging of the female organism leads eventually to cessation of the menstrual cycle, to involution of the ovary and of the uterine mucosa, and to a general loss of adaptability.

Many physicians consider Mongolism as something outside the realm of possibilities which could not occur in their families or in those of their friends. It must be emphasized that any normal mother is potentially the

mother of a Mongoloid baby if she is approaching menopause or carries her child under certain adverse conditions. A glance at the group of mothers who had a Mongoloid child after the age of 41 shows that they were average to superior citizens who constituted a healthy portion of the population. The 13 mothers had previously given birth to forty-three living children. Eight of them, or 61.5 per cent, had two or more children. The siblings of the Mongoloid children were all normal. Many were honor students in schools or universities, successful soldiers, or married women.

If the assumption is correct that a Mongoloid child can be the result of any pregnancy in which there is an abnormal biologic response to impregnation, brougnt about by the physiologic aging of the maternal organism beyond the age of 41, then one may look for factors with a similar effect in those women who have a Mongoloid child in their thirties or twenties.

The most outstanding symptom in the age group of 31 to 40 is the slow fertilization time. In the majority of cases the information was given that the mother had wanted a child, but in spite of her desire no pregnancy occurred. In the maternal age group between 31 and 40, 17 of 21 women, or 81 per cent, had a waiting time of three years or more, and 13, or 62 per cent, waited from five to twelve years for the birth of a child who was frequently the first or second one. In 10 cases, or 48 per cent of this group, the Mongoloid was the first child after such a waiting period. The "inability to become pregnant" is of great clinical significance; it indicates either lack of fertility or inability to maintain a pregnancy. In this connection the histories of previous abortions (15.7 per cent), bleedings during pregnancy (48.8 per cent), and menstrual irregularities in preceding years (47.6 per cent) are of increased importance. Bleedings during pregnancy occurred in almost half of the cases. These bleedings appeared in two ways. A number of mothers reported that they had continued to menstruate during two or three months of pregnancy and that they had, therefore, not been sure they were pregnant. Some skipped one menstruation and menstruated again at the end of the second and third months.

In mapping out the distributions of Mongoloid births and of instances of death due to diseases of the thyroid gland, Myers determined the geographic areas of the province of Ontario, Canada, with highest thyroid rates: the proportion of cases of Mongoloid children born in the area of highest "thyroid rates" was "43.1 per cent . . . as compared with 24.6 per cent for the control group." Myers not only considered this a significant statistical difference but also expressed the view that the same factor may explain the greatly reduced fertility of the mother giving birth to a Mongoloid child. According to Hoskins, the thyroid ranks second only to the pituitary as a cause of involuntary sterility in human beings. These observations may possibly serve to explain the multiple incidence of Mongolism in some families.

Proceeding to a discussion of the group of mothers who had a Mongoloid child in their twenties, one finds the same constellation which was observed in the age group above 31. The incidence of thyroid disorders was 38 per cent. Difficulties in becoming pregnant were seen in 46 per cent. Bleedings during pregnancy occurred in 38.5 per cent, and an irregular menstrual history was given in 23.1 per cent. The incidence of previous abortions (38.2 per cent) with 2 instances of two abortions each is also significantly high. While the long waiting time in this group is less conspicuous, because of the youthfulness of the women, the constellation of factors is identical and bears out the importance of an early recognition and treatment of this condition.

After the publication of two previous studies examining 250 and 75 cases, respectively, the present investigation covers a series of 64 new cases. Six cases were discarded as "without explanation." In 8 to 10 per cent satis-

factory data could not be obtained, either because information was withheld or because only a thorough physical examination and clinical study could produce the necessary facts. Fifty cases were divided into four groups according to age.

In the first age group, the mother was within or near the menopause. In 69 per cent she had not given birth to a child for a long time (seven to sixteen years). Uterine and ovarian dysfunction and previous abortion indicate an impaired generative faculty which developed in a previously healthy woman who, in the majority of cases, had given birth to normal children previously.

Mongolism is not a "monstrosity," but the result of a deceleration of the developmental rate during certain weeks of the gestation period (end of organogenetic period, from the sixth to the fourteenth week). The result of such interference with the developmental rate is an immature, "ill finished" child.

Potentially, Mongolism can be the outcome of any pregnancy, if a constellation of factors occurs which produces a threshold condition of sterility.

Since 45 per cent of the instances of Mongolism, however, occur in a maternal age group below 40 years of age who are well fitted for procreation, age alone cannot be the decisive factor.

Analysis of 21 instances in a maternal age group of 31 to 40 and of 13 instances in a maternal age group of 21 to 30 shows that certain constellations of factors may be expected to operate in all women who give birth to a Mongoloid child in their twenties and thirties. The most significant symptoms are: inability to become pregnant, impaired hormonal regulation, bleedings during pregnancy, menstrual irregularities, previous abortions, and uterine and ovarian anomalies. These symptoms are the result either of local conditions in ovary and uterus or of an endocrine inadequacy of the corpus luteum. Thyroid anomalies are so frequently seen that they are an important link in the chain of events. The common denominator is a threshold condition of sterility.

Mongolism, occurring about 3 times in every thousand births, is a condition which deserves more medical attention. As it is a "decelerating" growth deficiency in the prenatal period, still manifest in infancy, therapy has to concentrate on factors which may increase the developmental rate of the newborn. Although no definite cure is available, effective experimental treatment aiming at an increase of the growth rate (physical and mental) must start as early as possible.

The main problem of Mongolism is its prevention. With increased knowledge of those prenatal factors operating during gestation and resulting in malformations or deficient growth rates, careful observations must be collected with regard to all circumstances which may condition abnormal fetal growth. The present study offers new evidence that Mongolism is due to an abnormal maternal condition during the early part of gestation. It offers some clues as to the nature of the anomalies and postulates further investigations as to their specific mode of action.

This paper was presented at the First International Congress on Mental Deficiency, Boston, May 18 to 22, 1948.

Dr. Benda is director of research and clinical psychiatry, Walter E. Fernald School, Waverley, Mass., and instructor in neuropathology, Harvard Medical School, Boston.

REFERENCES

1. Benda, C. E., Dayton, N. A., and Prouty, R.: On the Etiology and Prevention of Mongolism, Am. J. Psychiat. **99**: 822, 1943.

2. Bennholdt-Thomsen, C.: Ueber den Mongolismus und andere angeborene Abartungen in ihrer Beziehung zum hohen Alter der Mütter, Ztschr. f. Kinderh. **53**: 427, 1932.

3. Benda, C. E.: Mongolism and Cretinism, New York, Grune & Stratton, Inc., 1946.

News and Notes

Central Section of the American Association of Orthodontists

The 1950 meeting of the Central Section of the American Association of Orthodontists will be held at Cedar Rapids, Iowa, September 10, 11, and 12.

Southern Society of Orthodontists

The twenty-sixth annual meeting of the Southern Society of Orthodontists will be held at the Sherry Frontenac Hotel, Greater Miami, Florida, Nov. 15, 16, and 17, 1950. Extensive plans and preparations are being made for this meeting. It will be held under the direction of President E. C. Lunsford, of Miami.

FRANK P. BOWYER, Secretary.

Northeastern Society of Orthodontists

The following is a list of officers of the Northeastern Society of Orthodontists elected at the recent meeting:

President, Richard Lowy	302 Main Street, Chatham, New Jersey
President-Elect, Paul Hoffman	1835 Eye Street, N. W., Washington, D. C.
Vice-President, Paul Geoffrion	1538 Sherbrooke Street, West, Montreal, Canada
Editor, J. A. Salzmann	654 Madison Avenue, New York, New York
Sectional Editor, Joseph D. Eby	121 East 60th Street, New York, New York
Director, George S. Callaway	654 Madison Avenue, New York, New York
Alternate, Clifford G. Glaser	1255 Delaware Avenue, Buffalo, New York
Secretary-Treasurer, Oscar Jacobson	35 West 81st Street, New York, New York

Board of Censors

John W. Ross, Chairman	1520 Spruce Street, Philadelphia, Pa.
Norman L. Hillyer	Professional Building, Hempstead, New York
Robert H. W. Strang	886 Main Street, Bridgeport, Connecticut

Executive Committee

Walter R. Bedell, Chairman	49 Market Street, Poughkeepsie, New York
William R. Joule	549 High Street, Newark, New Jersey
Eugene J. Kelly	455 West State Street, Trenton, New Jersey
B. Edwin Erikson	3726 Connecticut Avenue, N. W., Washington, D. C.
Z. Bernard Lloyd	2007 R Street, N. W., Washington, D. C.

Advisory Committee

Ralph Waldron, Chairman	549 High Street, Newark, New Jersey
Philip E. Adams	106 Marlborough Street, Boston, Massachusetts
John V. Mershon	1520 Spruce Street, Philadelphia, Pennsylvania

The Pacific Coast Society of Orthodontists

The Northern Section of the Pacific Coast Society of Orthodontists held its meeting in the Auditorium of the University of Washington Dental School at 9:00 A.M., Jan. 17, 1950. Alton Moore introduced Dr. Arne Bjork, who is visiting in our country from Sweden. With the exception of a brief business meeting, the entire day was given to Dr. Bjork.

Essentially Dr. Bjork is an anthropologist, but also practices orthodontics in his native country. The morning session was devoted to the "Nature of Prognathism." This discussion was based upon original research that he carried out on Swedish male population during the recent war; also the study of a Negro tribe which he conducted in South Africa during 1948. Both of these studies were carried on by means of cephalometric x-rays.

In the afternoon, Dr. Bjork discussed orthodontic treatment with the Andresen appliances and the method of constructing these applicances. He closed with an impromptu talk about South Africa which was illustrated by many beautiful color slides.

The following members and guests were in attendance: Drs. P. D. Lewis, Robert D. Butts, E. J. Fraser, D. C. McEwan, R. O. Gothenquest, Dick Cline, Lloyd Chapman, A. E. Stoller, Richard Reidel, Thurman Hice, G. A. Barker, H. J. Hammond, E. W. Tucker, David Hill, E. A. Bishop, James Keenan, A. W. Moore, M. R. Chipman, Gilmore, Kenneth Walley, Orwan, Percy Rumball, Takano, Ben Nickells, Kahan, Dick Philbrick, Empenger, Donner, A. S. Maxon, George McCullough, William McGovern, J. E. Richmond, and Harry Moore.

The Central Section of the Pacific Coast Society of Orthodontists held its quarterly meeting at the Alexander Hamilton Hotel, Tuesday, March 14, 1950.

Members present were: V. V. Smith, Lyle D. Russell, Jack McMath, Roy C. Cowden, Jack Loughridge, Kester Diment, Howard Jan, William Smith, Murray Ballard, Fred Epley, Howard Dunn, Geo. Lemon, Raymond E. Brownell, A. J. Corbett, James R. Seaman, Charles Biedinger, Harry S. Thompson, Ernest Johnson, Ray Lussier, Leland Carter, William Walsh, Arnold Wieser, Charles Konigsberg, E. R. Schroeder, Carl Engstrom, R. L. Blake, and Carl Showalter.

Guests present were: L. M. Cox, Peter Picard, Phil Konigsberg, Bill Ballard, Peter Ceremello, George Merchant, and Susan Locke.

In the afternoon, Program Chairman Charles Koni Konigsberg presented William Elsasser who lectured and presented a clinic on "The Uses of the Kesling Positioner."

Chairman Lussier read a letter from P.S.C.O. President C. F. Stenson Dillon urging the formulation of a plan for the management and disposition of practices of deceased members.

A motion was made by Ernest Johnson and seconded by A. J. Corbett that Stenson Dillon be authorized to formulate a plan and appoint a committee to make further study of the procedure, the plan to be presented to the membership for consideration and approval.

Chairman Lussier then presented Program Chairman Konigsberg, who in turn introduced the evening speaker, Dr. Wesley G. Irons, Chairman Cytology Section, American Institute of Radiation.

He gave a very interesting report on some of the work being done at the Institute at Belmont.

He then presented a report on his work on cancer research and some very interesting microscopic slides accompanied his talk.

Dr. Irons was graciously thanked by the Program Chairman and the meeting was adjourned at 10:15 P.M.

The Southern Section of the Pacific Coast Society of Orthodontists held its meeting at the Rodger Young Auditorium, 935 West Washington Boulevard, Los Angeles, California, on Friday, March 10, 1950.

The meeting was called to order at 3:45 P.M. by Harry Faulkner, Chairman, who presented Dr. Berneice Barkelew as Chairman of the Day.

Dr. Barkelew, in turn, introduced Mr. James Robinson, Executive Secretary of the Southern California State Dental Association. Mr. Robinson proceeded to talk on the economic relationship of dentistry and the public and emphasized the following points:

Although orthodontists are prone to keep to themselves, dentistry really comes first.

Orthodontists should take more active parts in the meetings and activities of the dental societies.

Public relations of the Southern California State Dental Association have been emphasizing dental health for children.

All dental practices are built at the side of the chair depending on how we handle people and the values we build. We are the profession's public relations men.

The patients always want to know how it is going to look, how it is going to feel, its usefulness, how long it is going to last, and its cost. Be prepared to give an exact fee.

Orthodontists should have their own x-ray equipment in order to give the patient more timely and complete service.

Orthodontics and pedodontia cannot be separated. Orthodontists should meet jointly with the pedodontists at least once a year.

As their new horizon, orthodontists should organize offices better, increase auxiliary help in their laboratories, and do more and better for less money.

Frederick A. Bricker read a paper on "Adjusting Traumatic Occlusion" in which he stated:

The orthodontist and periodontist have a great deal in common and formerly met together.

He believes in a psychological approach to healthy bodies. Today, health depends upon emotions whereas twenty-five years ago health depended upon what we ate.

He believes thoroughly in preventive dentistry. In becoming a violonist, the hardest task is learning how to hold the bow; and in learning correct care of the teeth, the hardest task is developing skill in handling the brush. He stated that preventive dentistry is being retarded by lack of training to teach. The art of teaching and not preaching should be used to obtain cooperation from the patient. Try to strike the patient's harmony cord.

He believes that if we have a normal, healthy patient, the occlusion will wear and grind itself into a good balance. Our teeth do not wear and reduce trauma because of refined diet.

He stated that because a loose tooth does not wear as much as a firm tooth, a dentist should have a patient come back once a year to grind the loose tooth.

The subject of identification buttons to be worn by members at meetings was referred to the Executive Committee for further discussion.

Sydney Cross was appointed by the Chairman to report on the activities of the national meeting to be held in Chicago in May, and to which nine members indicated intentions of going.

Fred McIntosh reported upon the Crippled Children's Act. He was reappointed to serve on both the Crippled Children's Committee and the Legislative Committee. Harvey Spears was appointed to serve with Fred on the latter committee.

The following men were elected to membership: Forrest D. Moody, Townsend B. Paul, Robert D. Payne, and Melvin V. Saxman.

The Secretary read a letter of appreciation from Mrs. Will Sheffer for the flowers sent at the time of the death of Will Sheffer.

Dr. Barkelew introduced Dr. Francis M. Pottenger who spoke on "Some Factors in the Development of the Malar Prominence" and showed slides and x-rays.

He has been working on the adrenal cortex for the last thirteen years and believes it to be an important factor in the growth and development of muscle, cartilage, and bone.

If the mother has adequate steroids the child will develop a normal jaw.

The bi-orbital width should be less than the bi-malar width.

All age groups that were nursed showed more development of the malar prominence than those that were not.

Body length should be the same from the top of the pelvis to the top of the head as from the top of the pelvis to the bottom of the feet.

Excerpt From the Bulletin of the Pacific Coast Society of Orthodontists

"THE AMERICAN ASSOCIATION OF ORTHODONTIA"

"No, our parent body has not changed its name but believe it or not, it was thus spelled in the program for the annual meeting of one of the component societies.

"For all general practitioners to use the newer term 'orthodontics'—not very new either—is a little too much to expect. But when orthodontists still use the outmoded and obsolete term "orthodontia,' we believe . . . or hope it is inadvertent.

"Perhaps there is no more diligent crusader for correct scientific terminology than he of the A.A.O. Nomenclature Committee, our own James D. McCloy who showed us the above mentioned program. Much credit indeed goes to Jim for he always gives much time and effort in a patient explanation of proper usage of the term. Here, in part, is his latest to the Secretary of the above society:

'The term orthodontia was originated by a Frenchman named Lafaulon in 1839. It was continued in the first dental dictionary which was written by Chapen A. Harris. It was a case where an error was perpetuated for we know that in the English Language since the 15th century, language authorities have utilized the ending *ics* to denote a science. Thus we have: orthopedics, pediatrics, mathematics, orthodontics, etc. The suffix ology is also permissible. Thus we have: ophthalmology, proctology, physiology, biology, etc. The ending "ia" may be correctly applied to remedies, geographical locations, flowers and diseases. Thus we have: morphia, Persia, gardenia and amnesia. I like this latter because it is indicative of the indifference of numerous members of our profession toward the all-important and fundamental subject of nomenclature.

'Whoever makes up this program ought to bring themselves up to date for in using "ia" as a suffix to denote a science, they're about 5 centuries behind the times.' "

Florida Orthodontic Study Group

The Florida Orthodontic Study Group held its annual meeting at Tampa, Florida, March 6, 7, and 8, 1950.

Dr. Samuel J. Lewis of Kalamazoo, Michigan, presented the following program:

The Application of the Tweed Philosophy to the Treatment of Malocclusion.

The Kesling Set-up for Case Analysis and Treatment Planning. Dr. Lewis made a complete set-up of a case of malocclusion and gave the analysis of anchorage, treatment, and retention.

Discussion of the Edgewise Arch Mechanism and Its Place in the Treatment of Malocclusion.

The Treatment of Class I and Class II Malocclusion on the Typodent. Dr. Lewis went through the treatment using the various arch wires, showing the movement of the teeth.

Soldering Technique, Arch Bending, and Auxiliary Attachment for the steel arch wires.

Discussion of Treatment When Dental Units Have to Be Removed.

Treatment of an Extraction Case on the Typodent.

The Use of the Head Gear in Gaining Anchorage and the Treatment of Certain Types of Malocclusion.

New Postgraduate Course in Orthodontics at Ohio State University

The College of Dentistry, Ohio State University, recently announced the addition of a new postgraduate course in orthodontics.

The course will consist of a fifteen-month full-time course for dental graduates. The first class will be admitted in October, 1950, and will complete their course in December, 1951. Attendance will be required during the summer quarter of 1951.

The postgraduate students will receive instruction in clinical orthodontics, basic concepts of orthodontics, orthodontic techniques, anatomy of the head and neck, oral histology, and oral pathology. A certificate will be issued upon satisfactory completion of the course.

The faculty includes Dr. E. G. Jones, Chairman, Dr. L. F. Edwards, Dr. J. R. Hull, Dr. R. M. Kincaid, Dr. P. C. Kitchin, Dr. D. C. Miller, Dr. H. B. G. Robinson, and Dr. R. E. Wade.

In addition to this postgraduate course, a graduate course leading to the degree of Master of Dental Science is offered by the Graduate School to qualified students in a minimum of two years.

Italian Convention on Stomatology

The twenty-fifth annual Italian Convention on Stomatology promoted by the A.M.D.I. (Italian Medico-Dental Association), affiliated society to the F.D.I., will be held from Sept. 26 to 30, 1950, at Stresa (Lake Maggiore).

Denver Summer Seminar

The Thirteenth Denver Summer Seminar will be held this year at the Park Lane Hotel, Denver, Colorado, July 30 through Aug. 4, 1950.

Dr. Albert Crosby Memorial Dedication

Dedicatory exercises were held at 321 Congress Avenue, New Haven, Connecticut, to mark the gift of x-ray equipment provided by Mrs. Albert W. Crosby of the Mohican Hotel in memory of her husband, the late Dr. Albert W. Crosby, who was First Vice-President of the Dental Clinic Society of New Haven.

Dr. Crosby, who died in 1938, lived in New Haven for seventeen years. He formerly was an associate clinical professor of dental surgery at the School of Medicine, Yale University, and wrote many articles on his specialty, orthodontics, for various dental journals.

Dr. Crosby was one of the pioneer orthodontists of New England.

American Dental Association

Preparations for the ninety-first annual session of the American Dental Association at Atlantic City, October 30 to November 2, moved forward rapidly this month (May) with the opening of the official housing bureau for the four-day meeting.

This year a new system of making hotel assignments will be followed. Reservations will be made as much as possible in accordance with the preference of the convention visitor instead of making priority classifications that were used formerly.

Official application forms may be found in *The Journal of the American Dental Association*, beginning with the May issue. Accompanying the application forms are detailed maps indicating the location of each hotel and the rates for each.

Reservations may be obtained by filling out the application blank and mailing it to the A. D. A. Housing Bureau, 16 Central Pier, Atlantic City, New Jersey. All reservations will be handled by the Bureau. The applicant will receive confirmation of his reservation directly from the hotel.

A record-breaking attendance has been predicted by Dr. Harold Hillenbrand, A. D. A. Secretary, and it is advised that reservations be made early in order that any preferences for hotels can be granted.

Atlantic City, a major contender for the title of the world's leading seashore resort, offers some 27,000 hotel rooms. Nineteen hotels face the sea and overlook the famous boardwalk that stretches eight miles along the ocean beach. There are 20 other fine hotels to choose from, all near the boardwalk.

Officials of the A. D. A. and members of the Committee on Local Arrangements, headed by Dr. Edward R. White, of Jersey City, New Jersey, have selected the Traymore and Claridge as official hotels for the mid-century meeting. The Board of Trustees will meet at the Traymore and section officers, essayists, and clinicians will have functions at the Claridge.

All hotels are within easy access to Convention Hall, constructed at a cost of $15,000,000 and containing the world's largest auditorium and exhibit space. Here the scientific sessions will be held.

Pointing out that Atlantic City yearly entertains some 15,000,000 visitors, local arrangements officials assert that the resort hotel construction has been directed toward providing the ultimate in comfort, relaxation, and elegance. There are sun decks, swimming pools, cabañas, and colorful flower beds.

Convention officials also point out that Atlantic City provides an outstanding place to combine work and play and that it is the one city to which a delegate can go and then return home refreshed rather than worn out.

The resort city is proud, too, of its food. It offers some of the finest seafood in the country at world-noted restaurants. There are at least 400 restaurants in Atlantic City proper, not including the numerous offshore eating places.

Transportation is no problem. For boardwalk promenades, there are the noted rolling chairs pushed by veteran attendants. And there are the new streamline chairs which are motor driven—but at a very slow pace. And one block from the broadwalk are the famous jitney buses that travel the entire length of Atlantic City for 10 cents. An area rich in tradition and history, it is only one hour from Philadelphia and four hours from New York.

Autumn is viewed as an ideal time to visit the resort. By day, there is warm sunshine salted by ocean breezes. At night, there is cool, crisp starlight.

Already, hotel assignments have been made for meetings of associated dental groups for the annual session. Among these are the American Academy of Periodontology, at the Claridge; American Academy of Restorative Dentistry, Chalfonte-Haddon Hall; American Association of Dental Editors, Traymore; American Association of Dental Examiners, Traymore; American Association of Public Health Dentists, Dennis; American Board of Oral Pathology, Claridge; American College of Dentists, Claridge; and American Dental Assistants Association, Chalfonte-Haddon Hall.

Others are the American Dental Hygienists Association, Chalfonte-Haddon Hall; American Denture Society, Seaside; American Society of Dentistry for Children, Ambassador; American Society of Oral Surgeons, Ritz-Carlton; Delta Sigma Delta, Marlborough-Blenheim; International College of Dentists, Chalfonte-Haddon Hall; National Association of Seventh Day Adventist Dentists, Dennis; Psi Omega, Ambassador; and Xi Psi Phi, Shelburne.

The Local Arrangements Committee, in addition to Dr. White as over-all chairman, includes Dr. Benjamin Rosenwasser, of Union City, New Jersey, and Dr. Eugene R. Westcott, of Atlantic City, as vice-chairmen, and Dr. Daniel F. Lynch, of Washington, D. C., and Dr. John S. Owens, of Camden, New Jersey, as honorary chairmen.

Members, all of New Jersey, appointed as chairmen and vice-chairmen of special committees for the convention, are Dr. Eugene W. Newman, of Red Bank, and Dr. Alfred W. Nelson, of West Englewood, clinic committee; Dr. J. Ward Weaver, of Pleasantville, and Dr. Allen J. Boyer, of Cranford, entertainment; Dr. John S. McQuade and Dr. Benjamin A. Brown, both of Atlantic City, information; Dr. Walter A. Wilson and Dr. Pierce A. Quirk, both of Jersey City, publicity; and Dr. William A. Giblin, of Montclair, and Dr. Charles P. Crowe, of East Orange, reception.

A.D.A. Campaign to Help Need for New Dental Books Abroad

Dentists and dental societies throughout the United States are urged to give concerted support to the campaign of the American Dental Association to help raise world health standards by establishing new dental libraries overseas through the CARE-UNESCO Book Fund Program. A $250,000 goal has been set for the campaign.

The plan to share American dental knowledge with dentists in war-depleted countries of Europe and Asia has been approved by the A.D.A. House of Delegates and is under the direction of Dr. Stanley Tylman, of Chicago, Chairman of the A.D.A. Council on International Relations.

Funds donated by individuals and organizations here are used by CARE-UNESCO representatives to buy the latest and best scientific and technical books for educational institutions abroad.

Dental text and reference books have been requested as priority needs by such instiutions as the new United States-sponsored Free University of Berlin; the Dental School of the University of Athens, Greece; the University Library of Brussels, Belgium, and the Library of the Institute of Science in Manila, the Philippines.

In every instance, the CARE-UNESCO reports show, reconstruction efforts are hampered by the lack of books to train professional men in new scientific techniques.

Book stocks were depleted first by the wartime confiscations and book-burnings carried on by the invading armies as part of their conquest plans.

Then came the bombings, which took a tremendous book toll: 150,000 books destroyed at the University of Vienna. . . . The library of the University of Caens, France, completely demolished. . . . 900,000 books reduced to ashes at the University of Louvain, Belgium. . . . $1,000,000 worth of books lost at the University of the Philippines. Aggravating those losses was the fact that no new books were received throughout the war years.

The end of the war did not end the book shortages. Virtually all technical book publishing in recent years has been done in the United States. The lack of dollars continues to make it impossible for foreign universities and libraries to buy the up-to-date books so easily available here.

Dentistry is one of 20 scientific book categories CARE, in cooperation with UNESCO, is helping provide for libraries abroad through the Book Fund Program, which was added to the CARE food and textile package service last spring. Funds contributed to the A.D.A. campaign will be used by CARE to buy and deliver the latest and best books on dental science to dental schools and libraries, in the name of the American Dental Association.

It is hoped that, through the A.D.A. campaign, at least 50 institutions will be benefited in the countries served: Austria, Belgium, Czechoslovakia, Finland, France, Great Britain, Greece, Western Germany and Berlin, Italy, the Netherlands, Norway, Malta, Japan, Korea, the Philippines, Siam, and Pakistan.

CARE's purchases of dental books are based on an extensive bibliography compiled by a professional committee of scientists and librarians. The subdivisions covered include caries treatment, oral pharmacology, oral prosthesis, dental materials, prophylaxis, oral diseases, orthodontics, oral anatomy, physiology, and histology.

Each book purchased through the A.D.A. campaign will bear a book plate inscribed: "A Gift from the American Dental Association"—a lasting memorial of the willingness of American dentists to share their technical knowledge. All contributions should be earmarked for the CARE Book Fund Program and sent to the American Dental Association, 222 East Superior Street, Chicago 11, Illinois.

Army to Hold Instructor Conference at Fort Sam Houston

The Army Medical Department's Second Medical Instructors' Conference will be held at the Medical Field Service School, Brooke Army Medical Center, Fort Sam Houston, Texas, March 27 through March 31, the Army Surgeon General's Office announced.

Attending or participating in the conference will be officers representing the Surgeons General of the Army, Navy, and Air Force, the Army Chief of Staff, National Guard Bureau, Army Field Forces, Armed Forces Staff College, Command and General Staff Corps, Armored School, Army General School, Infantry School, Chemical Corps School, Army Medical Department Research and Graduate School, the Surgeons of the six Army Areas and the Military District of Washington, V Corps, the 82nd Airborne Division, and the Medical Equipment Laboratory.

The party from Washington, headed by Major General George E. Armstrong, Deputy Surgeon General, will leave the Military Air Transport Service hangars at Washington National Airport early Saturday morning, March 25.

In addition to General Armstrong, the Army Surgeon General's Office will send Major General Walter D. Love, Deputy Chief, Dental Division; Brigadier General J. A. McCallam, Chief, Veterinary Division; Colonel John M. Caldwell, Jr., MC, Chief, Psychiatry and Neu-

rology Consultants Division; Colonel Hugh R. Gilmore, Jr., MC, Chief, Pathology and Allied Sciences Division; Colonel O. F. Goriup, MSC, Chief, Medical Service Corps Division; Colonel Thomas E. Patton, Jr., Assistant Chief, Preventive Medicine Division; Colonel Paul I. Robinson, MC, Chief, Personnel Division; Colonel A. L. Tynes, MC, Chief, Medical Plans and Operations Division; Colonel Floyd L. Wergeland, MC, Chief, Education and Training Division; Colonel William L. Wilson, MC, Special Assistant to the Surgeon General for Civil Health Affairs. Colonel William S. Stone, MC, Chairman, Medical Research and Development Board, now a surgical patient at Walter Reed General Hospital, will attend if sufficiently recovered by the date of departure, or will be represented by Lieutenant Colonel Frank L. Bauer, MC, Chief, Research Branch.

Also from Army SGO will be Lieutenant Colonel Stephen G. Asbill, VC, Chief, Depot Branch, Supply Division; Lieutenant Colonel John M. Gracie, II, MSC, Chief, Civilian Components Branch, Education and Training Division; Lieutenant Colonel C. H. Walsh, Chief, Organization and Equipment Branch, Medical Plans and Operations Division; and Major Stephen J. Beaudry, MSC, and Captain Maribeth T. Cardinal, MSC (WAC) of the Service Schools and Planning Branch, Education and Training Division.

Representing the Navy Bureau of Medicine and Surgery will be Rear Admiral Joel T. Boone, MC, and Captain Richard H. Fletcher, MC, Head, Training Branch, Professional Division.

Air Force Medical Service will send Colonel Joseph A. Baird, MC, Military Air Transport Service, Kelly Air Force Base, Texas; Lieutenant Colonels Charles H. Roadman, MC, and Benjamin A. Strickland, Jr., MC, School of Aviation Medicine, Randolph Air Force Base, Texas; Major Edward G. Streidl, MSC, Plans and Hospitalization Directorate, Surgeon General's Office.

Army Chief of Staff representatives will be Colonel Ansen D. Marston, GSC, G-4; Lieutenant Colonel Dan C. Russell, GSC, G-1; Colonel C. H. Swartz, GSC, G-3.

The remainder of the attendance list follows:

National Guard Bureau, Washington, D. C.—Colonel A. L. Streeter, Air Surgeon, Air Force Division.

Army Field Forces, Fort Monroe, Virginia—Brigadier General R. P. Williams, Surgeon.

Armed Forces Staff College, Norfolk, Virginia—Colonel A. B. Welsh, MC, Medical Instructor.

Command and General Staff School, Fort Leavenworth, Kansas—Colonel L. Holmes Ginn, Jr., MC, Medical Instructor.

Armored School, Fort Knox, Kentucky—Lieutenant Colonel Hubert L. Binkley, MC, Medical Instructor.

Army General School, Fort Riley, Kansas—Colonel I. Bradfield Smock, MC, Medical Instructor.

Infantry School, Fort Benning, Georgia—Lieutenant Colonel John R. Darrah, MC, Medical Instructor.

Chemical Corps School, Army Chemical Center, Maryland—Major Lowell E. Thompson, Cml C, Radiological Defense Instructor.

Army Medical Department Research and Graduate School, Army Medical Center, Washington, D. C.—Lieutenant Colonel W. D. Tigertt, MC, Deputy Commandant.

First Army Area, Governors Island, New York—Colonel Clement St. John, MC, Surgeon, and Major Gene Quinn, MSC, Assistant to Surgeon.

Second Army Area, Fort George G. Meade, Maryland—Colonel George E. Leone, MC, Deputy Surgeon.

Third Army Area, Fort McPherson, Georgia—Colonel Rollin L. Bauchspies, MC, Surgeon.

Fourth Army Area, Fort Sam Houston, Texas—Colonel David E. Liston, MC, Surgeon, and Lieutenant Colonel Harold E. Opsahl, MC, Deputy Surgeon.

Fifth Army Area, Chicago, Illinois—Colonel E. N. Billick, MC, Surgeon.

Sixth Army Area, San Francisco, California—Colonel Alvin L. Gorby, MC, Surgeon.

Military District of Washington—Colonel Robert E. Bittner, MC, Surgeon, and Captain Leonard L. Collier, MSC, Assistant to Surgeon.

V Corps, Fort Bragg, North Carolina—Colonel Thomas N. Page, MC, Surgeon.

82nd Airborne Division, Fort Bragg, North Carolina—Major S. H. Neel, Jr., MC, Surgeon.

Medical Equipment Laboratory, Fort Totten, New York—Colonel Robert J. Benford, MC, Chief, Engineering and Development Division, or Lieutenant Colonel Carlos F. Schuessler, MC, Deputy Chief.

Army Surgeon General Announces Reduction in Training Programs

A drastic cut in intern and residency training programs to be offered without endangering professional standards in Medical Department operation was announced today by Major General Raymod W. Bliss, Army Surgeon General.

"The curtailment is now possible as a natural culmination of rising professional standards and long range planning," General Bliss said. "I believe this action will be gratifying to American medicine in general because of a fear that the Army was committed to a program of over-specialization."

The reduction in intern and residency programs has no bearing on the recent closing of military hospitals but grows out of a long study of the Army's personnel needs.

The original graduate program was established with the assistance of the American Medical Association and other medical advisory groups with the goal of training 30 per cent of the Army Medical Corps as specialists. This quota was the same as that of the British Army and comparable to the American medical profession as a whole.

Immediately after the close of the war, with the release of the many clinical specialists who were temporary officers, the Medical Department had only a handful of qualified Regular Army officers remaining. Since this number was far too small to meet requirements, an extensive graduate training program was necessary. With the initial phase of this program substantially completed, it is now possible to reduce the numbers in training.

"A careful analysis of our requirements for specialists makes it possible for us to reduce our residency programs in many specialties and at the same time provide better qualified physicians to staff both our general and station hospitals," General Bliss reported.

"In this regard, I wish to emphasize that fine professional training will continue to be available in the Army Medical Department," General Bliss stated. "There will still be opportunities for first year residencies in military hospitals to fill normal attrition. There will continue to be spaces in second and third year residency training for those students found best qualified by the residency selection board. Residents scheduled for temporary overseas duty will return to their residencies. In addition, the training programs now maintained at all hospitals for their assigned personnel will continue to afford excellent professional training for all medical officers."

The professional training programs involved include civilian and miliary internships and residencies. Training in the civilian programs is accomplished at civilian institutions with a commitment for military service following completion of training. In the military programs, students receive their training in recognized Army general hospital teaching centers.

The following reductions will be effected:

Civilian internships—A reduction from 300 to 200 by July 1, 1950.

Civilian residencies—No new residents have been accepted since Jan. 1, 1950, and the program will close by attrition.

Military internships—A reduction from 199 to 150 by July 1, 1951.

Military residencies—A reduction of almost fifty per cent or a total of 245 by July 1, 1951, including a recent slash of 131 residencies, another 36 by July 1, 1950, and an additional 66 by July 1, 1951.

A sizable reduction in the military residency program has been made possible by comparing actual requirements in each medical specialty with the number actually on duty or expected to complete residency training. The resultant quotas recognize both the importance of the Army Medical Department having an adequate supply of specialists to meet its needs and the undesirability of overspecialization.

As a result of this analysis it will be possible to reduce spaces in urology, anesthesiology, general surgery, orthopedics, ophthalomolgy, otolaryngology, dermatology, medicine, pathology, radiology, plastic surgery, and physical medicine. Increased spaces will be provided for psychiatry and clinical medicine (general practice).

The resident selection committee in the Surgeon General's Office will continue to select residents for one-year appointments and to advance those who are best qualified.

General Bliss indicated that the streamlining of the residency program might make the eventual consolidation of teaching centers possible with all residency training conducted in centers with the best facilities, clinical material, and professional supervision.

Notes of Interest

Ernest H. Borgerding, D.D.S., M.S.D., formerly associated with Dr. Howard E. Strange, announces the opening of his own office for the exclusive practice of orthodontics at 1753 West 95th Street, Suite 204, Chicago 43, Illinois.

Dr. Theodore N. Engdahl announces that he is assuming the practice of the late Dr. Will G. Sheffer for the exclusive practice of orthodontics at 601 Medico-Dental Building, San Jose, California.

Dr. W. Bruce Malloch announces the opening of an office at 681 Main Street, East, Hamilton, Ontario, Canada, practice limited to orthodontics.

Eugene M. Nelson, D.D.S., announces the opening of his office at 102 Waterman Street, Providence, Rhode Island, practice limited to orthodontics.

Dr. Joseph A. Sheldon announces the opening of his office at 950 Park Avenue, New York 28, New York, practice limited to orthodontics.

Tobias Weissman, D.D.S., announces the opening of offices at 2239 East Colfax Avenue, Denver 6, Colorado, practice limited to orthodontics.

Dr. Frederick T. West and Dr. Eugene E. West, orthodontists, announce the removal of their office to 760 Market Street, Phelan Building, Suite 733, San Francisco 2, California.

Dr. Edward Wright announces the removal of his offices to 125 West Manchester Boulevard, Inglewood, California, practice limited to orthodontics.

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